

ESTIMATING COSTS OF BEEF PRODUCTION



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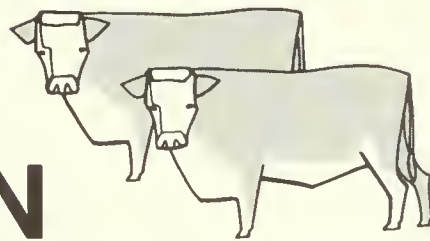
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ESTIMATING OF BEEF PRODUCTION

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ESTIMATING COSTS OF BEEF PRODUCTION

This publication contains estimates and procedures for estimating production costs in cow-calf and feeder enterprises. Figures are provided to represent a very wide range of beef production situations. Some situations will be unprofitable at average prices and others will be profitable under nearly all price conditions experienced in the past decade.

For those already producing beef, and for those thinking of taking it up, estimates of likely costs and returns are important. In particular, those thinking of entering beef production should have a good knowledge of the performance levels they will need to reach if they are to be successful. They need to know what beef prices they can expect and how this price varies from time to time. Successful operation requires that specific price levels and seasonal price fluctuations be recognized and taken into account.

Table 1 shows the percentage of months with various levels of prices for three beef cattle classes at Toronto during the 1951-1970 period; gives the mean monthly prices for the cattle during the 20-year period, and compares the mean annual prices for the periods 1951-1965 and 1966-1970.

COW-CALF ENTERPRISE

The expense items to be accounted for in this enterprise are feed (nursing cow, dry cow, bull and sometimes creep), veterinary services, medicine, utilities, change in value of cows and bulls (depreciation or appreciation) including death loss, buildings, labor, interest or cost of capital, miscellaneous and bedding. The value of manure is assumed to cover the cost of its removal.

Important variation, from farm to farm and from time to time on the same farm, can be expected in enterprise size, cow weight, calving date, percentage calf crops, housing facilities, nursing period, feed requirements and many other factors. The tables following can be used to calculate the expenses associated with various levels of these items.

FEED

Tables A1 and A2¹ identify 42 combinations of calving dates (December 1 to June 1) and mean annual cow weights (770 lb to 1320 lb). The number of days on each of the gestating and nursing rations for which stored feeds and pasture are required and the daily and total energy requirements for these periods are also shown.

After deciding which program or combination of calving date and mean cow weight best represents the situation to be costed, Table A1 can be used to read the total TDN (total digestible nutrient) requirement during the winter for the gestating and nursing periods separately. This table also shows the number of days on stored feeds for the gestating and nursing periods separately. Table A2 shows the TDN requirements for nursing cows on pasture for the various programs. It is to be noted that the energy and protein requirements of nursing cows drop considerably 4 months after calving. The two tables together indicate the cow's annual energy requirement.

¹Where a capital A precedes number, table will be found in Appendix 1, pp. 17-48.

TABLE 1. BEEF CATTLE PRICES, TORONTO²

(a) Frequency Distribution of Monthly Prices, 1951-1970

Average monthly price \$/cwt	below	20.00-	22.00-	24.00-	26.00-	28.00-	30.00-	above
Good slaughter steers	20.00	21.99	23.99	25.99	27.99	29.99	32.00	32.00
% of months	20	7	23	19	13	8	4	6
Average monthly price \$/cwt	below	12.00-	14.00-	16.00-	18.00-	20.00-	22.00-	above
Good cows	12.00	13.99	15.99	17.99	19.99	21.99	24.00	24.00
% of months	10	10	21	27	15	11	5	1
Average monthly price \$/cwt	below	20.00-	24.00-	27.00-	30.00-	33.00-	above	
Good feeder steers	20.00	23.99	26.99	29.99	32.99	36.00	36.00	
% of months	23	27	19	16	6	8	1	

²Data provided by D.L. Faulkner, P.E.I. Dept. of Agriculture and Forestry.

(continued)

TABLE 1. BEEF CATTLE PRICES, TORONTO² (concluded)

(b) Frequency Distribution of Monthly Prices, 1966-1970

Average monthly price \$/cwt	below	25.00-	26.00-	27.00-	28.00-	29.00-	30.00-	above
Good slaughter steers	25.00	25.99	26.99	27.99	28.99	29.99	30.99	31.00
% of months	6.7	10	15	26.7	13.3	10	5	13.3
Average monthly price \$/cwt	below	19.00-	20.00-	21.00-	22.00-	23.00-	above	
Good cows	19.00	19.99	20.99	21.99	22.99	23.99	24.00	
% of months	10.4	22.9	25	18.8	10.4	8.3	4.2	
Average monthly price \$/cwt	below	27.00-	29.00-	31.00-	33.00-	above		
Good feeder steers	27.00	28.99	30.99	32.99	34.99	35.00		
% of months	3.3	45	20	10	13.3	8.3		

(c) Mean Monthly Prices, \$/cwt, 1951-1970

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Good slaughter steers	24.28	23.83	22.71	23.94	24.27	24.58	24.84	24.84	24.79	24.21	24.31	24.49
Good cows	16.02	16.33	16.99	17.65	17.82	18.07	17.16	16.76	16.48	15.74	15.31	15.54
Good feeder steers	23.88	23.94	24.22	24.65	25.08	25.56	25.04	24.88	24.74	24.33	24.18	24.30

(d) Mean Annual Prices, \$/cwt, 1951-1965 and 1966-1970

	Mean price 1951 - 1965	Mean price 1966 - 1970
Good slaughter steers	23.09	28.08
Good cows	15.63	20.80
Good feeder steers	22.72	30.09

²Data provided by D.L. Faulkner, P.E.I. Dept. of Agriculture and Forestry.

Table A3 can be used to find the weight of feed necessary to meet the cow's energy requirements during both the gestation and nursing periods. It can be used only when the energy level in the available feed or in a mixture of feeds equals or exceeds the cow's minimum energy requirement.

Calculation of feed requirements when two or more feeds need to be mixed or fed together to meet the cow's minimum energy levels is somewhat more complex. Table A4 shows the proportions of an energy supplementing feed that must be added to a basic feed to yield a mixture that meets the energy requirements of dry, pregnant, mature cows (and presumably nursing cows more than 4 months after calving as well). Table A5 shows the proportions of a protein supplementing feed that must be added to a basic feed to yield a mixture that meets the protein requirements of dry, pregnant, mature cows. Tables A6 and A7 provide the

same information for nursing cows up to 4 months after calving.

Up to this point, consideration has been given only to mixing feeds to satisfy either -- *but not both* -- minimum energy or protein requirements. Meeting both is essential. The following is an example of how this may be done.

EXAMPLE CALCULATION:

Animal program: Calves born about March 1. Mean cow weight, 1,100 lb.

Available Feeds: Oat straw³, 44% TDN and 4% crude

³Caution is necessary in using feeds of low energy and high fibre content. Because of a variety of factors, cattle may consume less than the amounts calculated from feeding standards. In such cases, the ration should be adjusted with higher quality feeds to maintain adequate nutrition.

protein (C.P.); barley, 80% TDN and 9% crude protein⁴; soybean oil meal (SBOM), 83% TDN and 50% crude protein⁵.

Ration for Gestation (stored feeds): Table A1 indicates that 1,042 lb TDN are needed for this calving date and cow weight. The minimum level of TDN is 50% and for crude protein, 5.9%. Oat straw and barley will be mixed to yield the minimum TDN level. Table A3 cannot be used at this point. Table A4 indicates that a ration of 17% barley and 83% oat straw will be 50% TDN. The crude protein level of this mixture is $(17 \times .09) + (83 \times .04) = 4.8\%$. Soybean oil meal will be mixed with the barley and oat straw ration to provide the minimum protein level of 5.9%. Table A5 indicates that a mixture of 2.4% soybean oil meal and 97.6% oat straw and barley will yield the desired 5.9% of protein. The final ration is: $17 \times .976 = 16.6$ lb barley, $83 \times .976 = 81.0$ lb oat straw and 2.4 lb soybean oil meal per 100 lb of the mixture on a 100% dry-matter basis. This mixture is 50.9% TDN and 5.9% crude protein. Table A3 can now be used to determine that the 1,042 lb TDN required by the cow can be supplied by 2,047 lb of this ration. This is 2,380 lb on an 86% dry-matter basis.

Ration for Nursing (stored feeds): Table A1 shows that 1,003 lb TDN are needed for this program. The minimum levels of TDN and crude protein are 57% and 9.2%, respectively. Table A6 indicates that a ration of 36% barley and 64% oat straw (by inference) will be 57% TDN. The crude protein level of this mixture is $(36 \times .09) + (64 \times .04) = 5.8\%$. Table A7 indicates that a mixture of 7.7% soybean oil meal and 92.3% oat straw and barley will yield the desired 9.2% crude protein. The final ration is $36 \times .923 = 33.2$ lb barley, $64 \times .923 = 59.1$ lb oat straw and 7.7 lb soybean oil meal per 100 lb of the mixture on a 100% dry-matter basis. This mixture is 59% TDN and 9.2% crude protein. Table A3 can now be used to determine that the 1,003 lb TDN required by the cow can be supplied by 1,700 lb of ration. This is 1,977 lb on an 86% dry-matter basis.

⁴Cereals grown in the Maritime provinces range considerably in energy and protein levels. The value of 9% crude protein shown here is in the lower part of this range. The values for energy and protein used in ration formulation should be obtained, where possible, from provincial feed-testing services.

⁵There are protein sources available that are less costly than soybean oil meal; urea is one of these. Obviously, the cheapest suitable protein source should be used.

Pasture for Gestation and Nursing: Table A2 shows that this program requires 581 lb + 1,016 lb or 1,597 lb TDN from pasture. If pasture is 65% TDN on a 100% dry-matter basis, 2,462 lb of grass, 100% dry matter, will be required (Table A3).

Total Feed Requirement:

$$\text{Barley: } 16.6 \times \frac{2,047}{100} + 33.2 \times \frac{1,700}{100} = 904 \text{ lb dry matter}$$

$$\text{Oat straw: } 81 \times \frac{2,047}{100} + 59.1 \times \frac{1,700}{100} = 2,663 \text{ lb dry matter}$$

$$\text{Soybean oil meal: } 2.4 \times \frac{2,047}{100} + 7.7 \times \frac{1,700}{100} = 180 \text{ lb dry matter}$$

$$\text{Pasture: } 2,462 \text{ lb dry matter or } \frac{2,462}{5,000} = 0.49 \text{ acres, if pasture yields 5,000 lb/dry matter/ac. The pasture allowance should be increased by 15 to 20% to allow for calf's nutrition.}$$

A NOTE OF CAUTION

This procedure using Tables A3 to A7 balances a ration for energy and protein only. Vitamins, minerals and salt have not been included. Rations should be carefully formulated to take these items into account and should also be based on the general rules of feeding as found in such publications as: 'Feeding Guide for the Atlantic Provinces'.

Table A8 shows total annual feed, annual TDN requirement, TDN and protein levels for bulls of various weights. Data in this table, used in conjunction with Tables A9 and A10 (proportions of energy and protein supplementing feeds necessary to achieve energy and protein levels of 60% and 13.3%, respectively), can be utilized to prepare rations for bulls. The procedure is identical with that used to calculate cow rations. Tables A24 to A33 may also need to be used, depending on the bull's feed requirement. The cost of the feed can be calculated simply as the sum of the products of the amounts of various feeds and their unit prices.

Table A11 shows the annual cost of bull feed on a per-cow basis for various levels of annual feed cost per bull and various numbers of cows per bull.

The non-milk feed consumption of calves before weaning is highly variable depending on the cow's milk supply, the quality and quantity of pasture available, the calf's rumen development and whether or not creep

feeding is practiced. For calves not creep fed, a pasture allowance of 15 to 20% of the cow's requirement for pasture is suggested.

ANIMAL DEPRECIATION

The amount of cow depreciation (change in cows' value over their productive lives) to be charged on a per-year basis depends on the initial value of the cows, their value when culled, percent death loss and their expected service life.⁶ Table A12 shows annual cow depreciation for various levels of total depreciation and expected service life. The death loss percentage can be applied to the cows' cull value, and should be used in arriving at total depreciation per cow.

The annual amount of bull depreciation on a per-cow basis depends on the bulls' initial and final values, percent death loss, their expected service life and the cow/bull ratio. Table A13 shows these amounts for a wide combination of circumstances. Death loss should be taken into account in estimating total bull depreciation.

REAL ESTATE COSTS

Housing for cattle is important in achieving desirable rates of production. The housing can range widely in cost and sophistication, but in terms of the animals' comfort and productivity there are only two requirements: shelter from wind and from wetness.

Annual real estate costs comprise depreciation of buildings and associated facilities and equipment, repairs, taxes and insurance. These are commonly expressed as a percentage of the total real estate investment. Thus if the total real estate investment per cow is \$50 and annual depreciation is 12%, repairs 2%, taxes 1% and insurance 0.5% of total investment, the annual total charge for these items would be 15.5% of \$50, or \$7.75. Table A14 provides data on real estate investment and cost per cow. The investment per cow should be calculated on the number of cows actually housed, and not merely on the building's full capacity.

LABOR

Labor used in the cow-calf enterprise varies widely from farm to farm. It depends on the nature of the animals' housing; the equipment used in handling, feeding, bedding and cleaning the animals; calving date; the

ration and the amount of it fed; the nature of feed storage; the cow/bull ratio; whether artificial insemination is used; the percentage calf crop; the veterinary and medicine program and whether dehorning is practiced.

Labor, as discussed here, includes herd feeding, cleaning, bedding, inspection, dehorning and castrating of calves, purchasing and marketing of animals, calving assistance, breeding and veterinary-medicine activities.

Winter tasks in eight beef enterprises, ranging in size from 50 to 550 animals, were observed during 1970-72 in the Maritime provinces. Feeding programs varied widely and included hay, grass and corn silages, grain and potatoes. Feeding methods included manual handling of baled hay, with and without wagons, self-fed silage, tractor and bucket loading of forage boxes for silage distribution, tractor and bucket distribution of silage and the use of portable grinder-mixers for grain distribution.

None of the 8 enterprises was a cow-calf enterprise alone, and consequently, the figures provided for the cow-calf enterprise have been derived from the observations of the combined enterprises.

Considering all the factors mentioned as being relevant in determining per-cow labor requirements, it is estimated that between 2 and 4 hours per year per cow will be required for feeding, cleaning, bedding, inspection, dehorning and castrating of calves. Time involved in purchasing and marketing of animals, calving assistance, breeding and veterinary-medicine activities must be added to the 2 to 4 hours per cow per year range. Total requirements of 3 to 5 hours per cow per year should be realistic for herds of at least 50 cows fed, cleaned and bedded.

The figures given here are intended only as guides in estimating the actual labor requirements for various situations. They are not to be used as absolute standards. Higher levels of investment in feeding and handling equipment and facilities can easily result in lower labor requirements.

Labor for building and equipment repairs and maintenance is not included in these figures. Labor for repairs and the cost of materials are included in real estate cost.

OTHER COSTS

Costs of utilities, veterinary services and medicine, bedding and miscellaneous items vary widely from farm

⁶Cow or bull depreciation/year (\$) =
$$\frac{\text{initial value} - \text{cull value} (1 + \text{death loss proportion})}{\text{expected years of service life}}$$

to farm and from time to time. In the following example of costing a cow-calf enterprise, the single values used for these items have been taken from farm surveys. Other figures more appropriate to different situations should be used if they are available.

Annual interest charges or cost of capital on a per-cow basis can be calculated fairly accurately by using the following procedure:

Annual interest is the interest rate multiplied by the average total investment per cow. Average total investment per cow is the sum of:

- a) $\frac{1}{2} \times (\text{cow purchase value} + \text{cow cull value})$
- b) $\frac{1}{2} \times \frac{(\text{bull purchase value} + \text{bull cull value})}{\text{cow/bull ratio}}$
- c) $\frac{1}{2} \times \text{total real estate investment/cow}$
- d) $\frac{1}{2} \times \text{total annual feed cost/cow}$

While the assignment of a charge for management is usually subjective and arbitrary in general situations, individual operators may find it relatively easy. A common procedure used in calculating this cost is to take a percentage of gross receipts.

AN EXAMPLE COSTING

Following is an example costing of a cow-calf enterprise.

The first step is to describe the enterprise by providing the necessary information items.

Information

item no.	Item	Level
1.	Cow weight and calving date	1,100 lb March 1
2.	Energy and protein levels of basic feed, %	50, 8
3.	Price of basic feed/lb, fob feed bunk	\$0.0125 ^a
4.	Energy and protein levels of energy supplementing feed, %	80, 9
5.	Price of energy supplementing feed/lb fob feed bunk	\$0.02 ^a
6.	Energy and protein levels of protein supplementing feed, %	83, 50
7.	Price of protein supplementing feed/lb, fob feed bunk	\$0.06 ^a
8.	Amount of basic feed required, air dry basis, cows, lb	3,948

9.	Amount of energy supplementing feed required, air dry basis, cows, lb	455
10.	Amount of protein supplementing feed required, air dry basis, cows, lb	50
11.	Energy and protein levels of pasture, %	65, 15
12.	Amount of pasture required, cows (plus 20% for calf), acres, (based on 5,000 lb D.M. yield/ac)	0.6
13.	Price of pasture/ac	\$ 40
14.	Amount of creep feed fed, air dry basis, lb	—
15.	Price of creep feed/lb, fob feeding area	—
16.	Bull weight, lb	1,540
17.	Amount of basic feed required, air dry basis, bull, lb	8,235
18.	Amount of energy supplementing feed required, air dry basis, bulls, lb	2,460
19.	Amount of protein supplementing feed required, air dry basis, bulls, lb	770
20.	Cow/bull ratio	30
21.	Initial cow value, fob farm	\$ 300
22.	Cull cow value, fob farm	\$ 240
23.	Cow death loss %	2
24.	Total cow depreciation, including death loss adjustment	\$ 60
25.	Expected cow service life, yr	7
26.	Initial bull value, fob farm	\$ 600
27.	Cull bull value, fob farm	\$ 300
28.	Bull death loss %	3
29.	Total bull depreciation, including death loss adjustment	\$ 300
30.	Expected bull service life, yr	4
31.	Total real estate investment/cow	\$ 20
32.	Annual real estate cost %	10
33.	Hourly wage rate	\$ 1.50
34.	Annual interest rate, %	7
35.	Annual management charge, % of calf receipts	4
36.	Expected calf price/lb, fob farm	\$ 0.35
37.	Amount of bedding, lb	1,600
38.	Price of bedding/lb, fob lot	\$ 0.005
39.	Weaning weight, av of steers and heifers, lb	500
40.	Weaning %	90

^aFeed prices are fob farm. In the case of homegrown feeds the price covers all costs including operator's labor and management, interest and storage charges. See 'Maritime Grain Production Costs' and 'Maritime Forage Production Costs'.

ITEM AMOUNTS AND COSTS PER COW PER YEAR

Expense		Item no.	Table	Amount	Cost/yr	% of total cost
A	Basic feed, cows	1 to 10 inc.	A1 to A7 inc.	3,948 lb	\$ 49.35	31.8
B	Energy supp. feed, cows	1 to 10 inc.	A1 to A7 inc.	455 lb	9.12	5.9
C	Protein supp. feed, cows	1 to 10 inc.	A1 to A7 inc.	50 lb	2.94	1.9
D	Pasture, cows	1 to 13 inc.	A1 to A7 inc.	0.6 ac	24.00	15.4
E	Creep, calf	14, 15	—	—		
F	Basic feed, bulls	3, 5, 7, 16 17, 18, 19, 20	A3, A8, A9 A11, A31	8,235 lb	3.43	2.2
G	Energy supp. feed, bulls	3, 5, 7, 16 17, 18, 19, 20		2,460 lb	1.64	1.0
H	Protein supp. feed, bulls	3, 5, 7, 16 17, 18, 19, 20		770 lb	1.54	1.0
I	Salt, vitamins, minerals	—		—	2.00	1.3
J Subtotal, items A-I: feed					\$ 94.02	60.5
K	Cow depreciation	21-25 inc.	A12		8.57	5.5
L	Bull depreciation	26-30 inc.	A13		2.50	1.6
M	Real estate charge	31, 32	A14		2.00	1.3
N	Veterinary medicine	—	—		2.00	1.3
O	Utilities and miscellaneous	—	—		2.00	1.3
P	Bedding	—	—	1,600 lb	8.00	5.1
Q Subtotal, items K-P					\$ 25.07	16.1
R	Labor	—	—	4 hrs	6.00	3.9
S	Cost of capital	3, 5, 7, 8-10, 12-19, 24, 29, 31, 34	—			
$.07 \times \left(\frac{\text{cow}}{(300 + 240)} + \frac{\text{bull}}{2 \times 30} + \frac{\text{housing feed}}{\frac{20}{2} + \frac{94}{2}} \right)$					23.94	15.4
T	Management	35, 39, 40, 41	—			
$.04 \times .35 \times \frac{525}{2} + 475 \times 0.9$					6.30	4.1
Total cost/cow					\$155.33	100.0
U	Receipts, 475 lb heifer, 525 lb steer, at \$0.35/lb, 90% weaning rate				\$157.50	
V	return to labor, management and capital, U-J-Q				\$ 37.93	
W	Return to management and labor, V-S				\$ 13.99	
X	Return to management, W-R				\$ 7.99	
Y	Return to capital, V-R-T				\$ 25.63	
Z	Return to labor, W-T				\$ 7.69	

POSSIBILITIES FOR ADJUSTMENT

In the example, all feed makes up about 60% of the total cost and cost of capital accounts for about 15%. These are the two largest items in the cost of producing calves and together make up 75% of total cost. The key to

profitable calf production lies in keeping these costs as small as possible without reducing the productivity of the cow.

For any particular interest rate at which capital is available, the cost of capital can only be reduced by

limiting investment in cows, bulls, real estate and feed to an extent that is consistent with desired production rates.

The costs shown for animal depreciation, real estate, veterinary services, medicine, utilities and miscellaneous are low. The possibilities for further reducing these costs are small. It is easy, however, for them to be increased very greatly.

The importance of a high calving percentage is difficult to overestimate. Table 2 shows how the cost per calf varies with total annual cost per cow and with calving percentage.

Table 3 shows the influence of various percentage changes in feed costs, interest rate, and cow depreciation on total cost per cow, when all other factors are at levels shown in the example.

Table 3 clearly demonstrates the particular importance to net returns of changes in feed costs. At current and foreseeable forage/grain price ratios in the Atlantic

region, it is clear that the production of forages with quality sufficient to meet the cows' requirements for energy and protein levels is a key element in inexpensive feeding. The amount of high-quality forage (57% TDN and 9.2% crude protein, as minimums for nursing cows) that should be harvested depends on the calving date and hence, the portion of the cows' nursing requirements that will be provided by pasture.

Feeding forages of this quality during gestation will result in either excessive weight gains or the necessity of limit feeding. Limit feeding may result in uneven nutrition within the herd or in additional labor, or both.

In many practical circumstances, however, weather conditions result in the harvesting of forages having a wide range in quality. The best quality forage should be fed during the nursing period.

Often, forages cut at the high-quality stage (mentioned previously) yield very nearly the same amounts of dry matter as do forages cut at lower quality. The cost of production of high-quality forages is therefore often

TABLE 2. COST PER CALF SOLD

Total annual cost/cow	Weaning percentage ^a						
	65	70	75	80	85	90	95
\$ 95	\$146.15	\$135.71	\$126.67	\$118.75	\$111.76	\$105.56	\$100.00
105	161.54	150.00	140.00	131.25	123.53	116.67	110.53
115	176.92	164.29	153.33	143.75	135.29	127.78	121.05
125	192.31	178.57	166.67	156.25	147.06	138.89	131.58
135	207.69	192.86	180.00	168.75	158.82	150.00	142.11
145	223.08	207.14	193.33	181.25	170.59	161.11	152.63
155	238.46	221.43	206.67	193.75	182.35	172.22	163.16
165	253.85	235.71	220.00	206.25	194.12	183.33	173.68
175	269.23	250.00	233.33	218.75	205.88	194.44	184.21
185	284.62	264.29	246.67	231.25	217.65	205.56	194.74
195	300.00	278.57	260.00	243.75	229.41	216.67	205.26

^a $\left(\frac{\text{calves sold}}{\text{cows wintered}} \right) \times 100$

TABLE 3. EFFECT OF CHANGES IN FEED COSTS, INTEREST RATE AND COW DEPRECIATION ON TOTAL COST PER COW

Factor	Example level	% change	Cost difference/cow
Feed	\$94.02	20	\$18.80
Interest rate	7%	25	5.99
Total cow depreciation	\$60.00	50	4.28

TABLE 4. RATION COSTS FOR 1,100-LB NURSING COWS FED ON HAYS OF VARIOUS QUALITIES OVER 76-DAY FEEDING PERIOD

Ration	Hay 1 ^a	Hay 2 ^b	Hay 3 ^c	Barley ^d	SBOM ^e	Cost ^f
1	1,490 lb	—	—	445 lb	805 lb	\$32.32
2	—	1,870 lb	—	160	10	27.22
3	—	—	1,945 lb	—	—	24.30

^a50% TDN, 7% crude protein, dry-matter basis

^b55% TDN, 9% crude protein, dry-matter basis

^c60% TDN, 11% crude protein, dry-matter basis

^d80% TDN, 9% crude protein, dry-matter basis

^e83% TDN, 50% crude protein, dry-matter basis

^fhays at \$25/ton, barley at \$2/cwt and soybean oil meal at \$120/ton

very nearly the same as that for low quality forage. Table 4 shows the difference in costs for nursing rations (see example calculation, pp. 6 and 7) that result from forages of different qualities supplemented with barley and soybean oil meal, when production costs of the hays are equal.

FEEDER ENTERPRISE

The expense items to be accounted for in this enterprise are feed, the feeder, labor, real estate, animal mortality, veterinary services, medicine, utilities, miscellaneous, bedding and cost of capital. The value of manure is assumed to cover its removal costs. Important variation among feeder enterprises occurs in size of operation, feed conversion, length of keep or rate of turnover, weight at which animals are purchased and sold, feed prices, feeding program and proportion of building capacity used. The following tables can be used to calculate per animal expenses when these are at various levels.

ANIMAL PROGRAM

Tables A15 to A23 list beginning and ending weights, average daily gain, total gain, days on feed, TDN and crude protein requirements, and minimum feed levels for TDN and crude protein for

- finishing steer calves
- finishing yearling steers
- finishing two year old steers
- finishing heifer calves
- finishing yearling heifers
- growing steers (200-day feeding period)
- growing heifers (200-day feeding period)

- growing steers (165-day feeding period)
- growing heifers (165-day feeding period)

These tables provide approximate feed requirements, energy and protein characteristics for animal programs with specified beginning and ending weights, and average daily gain. They cover a wide range of situations including pasturing and wintering at three rates of gain, as well as full feeding.

FEED

Tables A24 to A28 show the proportions of feeds containing various TDN percentages necessary to yield specified TDN levels. These specified levels are 60%, 63%, 65%, 72% and 74% on a 100% dry-matter basis, and closely approximate the energy levels required by the classes of stock mentioned previously.

Tables A29 to A33 show the proportions of feeds containing various crude protein percentages necessary to yield specified crude protein levels. These specified levels are 8%, 9%, 10%, 11% and 12%, and closely approximate the protein levels required by the classes of stock mentioned previously.

Tables A24 to A33 permit the rapid calculation of rations for the animal programs listed in Tables A15 to A23. The procedure is the same as that outlined in the cow-calf section.

EXAMPLE CALCULATION

As an example, suppose that 400-lb calves are purchased in the fall (end of October) to be carried through the winter (200 days) at an average daily gain of 1.1 lb,

pastured to gain 1.65 lb/day and finished in dry lot at 3 lb/day for about 60 days.

Table A20 shows that the calf will require 1,549 lb of TDN in a ration made up of 60% TDN and 10.5% crude protein during the wintering period. Available feed consists of hay (55% TDN and 10% C.P.) and barley (80% TDN and 11% C.P.) and SBOM (83% TDN and 50% C.P.). Table A24 shows that a mixture of 80 lb hay and 20 lb barley will have a TDN level of 60%. The protein level of this mixture is $(80 \times .10) + (20 \times .11) = 10.2\%$, or 0.3% less than the animal's requirement. Table A32, by interpolation, indicates that the final ration should have about 1% soybean oil meal. The final mixture is $80 \times .99 = 79.2$ lb hay, $20 \times .99 = 19.8$ lb barley and 1 lb soybean oil meal/100 lb of ration. The TDN and protein levels of this ration are 60.2% and 10.6%, respectively. The total amount of this ration required is 2,572 lb on a 100% dry-matter basis. This total is made up of 2,037 lb hay, 509 lb barley and 26 lb soybean oil meal, or 2,370 lb hay, 590 lb barley and 30 lb soybean oil meal on an 86% dry-matter basis.

For the pasture period of 165 days, Table A22 shows (by interpolation) that the animal will require 2,030 lb of TDN in a ration of 63% TDN and 9.8% crude protein. Well-managed pasture will have nutrient levels in excess of these. If the pasture yields 5,000 lb/ac of dry matter at 65% TDN, 0.62 ac/head will be required $(2,030/.65 = 3,123$ lb dry matter; $3,123/5,000$ lb dry matter/ac = 0.62 acre).

For the finishing period of 60 days, Table A17 indicates (by interpolation) that 1,080 lb of TDN in a ration of 71% TDN and 11% crude protein is required. Table A27 shows (by interpolation with Table A26) that a mixture of 36 lb hay and 64 lb barley will have a TDN level of 71%. The protein level of this mixture is $(36 \times .10) + (64 \times .11) = 10.6\%$ or 0.4% less than the animal's requirement. Table A32 indicates that the final ration should have 1% soybean oil meal. The final mixture is $36 \times .99 = 35.6$ lb hay, $64 \times .99 = 63.4$ lb barley and 1 lb soybean oil meal/100 lb of ration. The TDN and protein levels of this ration are 71.1% and 11.03%, respectively. The total amount of this ration required is $1,080/.711$ or 1,518 lb dry matter. This is made up of 541 lb hay, 962 lb barley and 15 lb soybean oil meal on a 100% dry-matter basis or 629 lb hay, 1,119 lb barley and 17 lb soybean oil meal on an 86% dry-matter basis.

Total stored feed requirements are 3,000 lb hay, 1,710 lb barley and 50 lb soybean oil meal on an 86% dry-matter basis. The total gain of about 670 lb will have

been put on over a period of 425 days. The annual turnover is 0.8 (365/425). The annual feed requirement will be the same as the feed requirement for the whole feeding period if calves are purchased each fall at weaning and if the program is run continuously from one year to the next. Both calves and finishing cattle will be on hand during November and December.

Appendix 2 provides a procedure for costing farm prepared rations.

REAL ESTATE COSTS

Table A34 shows the annual real estate cost per head for different levels of total real estate investment per head and annual real estate cost percentage. The level of total real estate investment per head should be calculated from total real estate investment and the number of head of capacity in use. This permits total real estate investment per head sold to reflect the actual proportion of maximum building capacity being used. Table A35 shows real estate cost per feeder for the feeder's entire length of keep for different rates of turnover and annual real estate cost per head of capacity in use.

LABOR

The kind and arrangement of facilities used in caring for feeders varies greatly. Per-head labor requirements vary with the facilities and the number of animals being handled. The labor requirements shown in Table A36 have been derived from direct observation on 8 farms having between 50 and 550 head in Prince Edward Island and Nova Scotia.

Feeds and combinations of feeds include hay, hay and grain, silage, and silage and grain. Hay is hand loaded and unloaded from a wagon into a fence-line feed bunk. Silage is taken from a horizontal silo with a front-end loader. It is then either taken directly to a fence-line feed bunk, or put into a self-unloading wagon for distribution in a fence-line feed bunk. Self-fed silage is also included. Grain, protein supplements, minerals, etc. are distributed in a fence-line feed bunk from a portable mix-mill. In these estimates, it has been assumed that the feed is ground and mixed daily.

Pens are cleaned weekly with a tractor and scraper; manure and bedding are moved to an adjacent pile for later spreading. Fresh bedding is distributed weekly; bales of straw are hand loaded and unloaded from a wagon for spreading in the pens.

These estimates of labor requirements are for herds in excess of 100 animals. Herds smaller than this, or larger than 300 head would show larger and smaller per-head labor requirements, respectively.

The influence of amounts of feed on labor requirements per head is not shown because it is small when feed handling is mechanized. Grain mixing and feeding times are based on 12 lb per head per day and a return trip distance of 800 feet.

Although the labor requirements shown in Table A36 will not adequately reflect the situation on all farms, it is easy to substitute more appropriate figures if they are available.

OTHER COSTS

Costs of utilities, death loss, miscellaneous, veterinary services and medicine vary widely from farm to farm and from time to time. In the following example of costing for a feeder enterprise, the values used for these items have been taken from farm surveys. Other figures more appropriate to different situations should be used if they are available.

Interest or cost of capital charges per animal can be approximated by using the following procedure:

Interest per feeder is the interest rate multiplied by the average total investment per animal where average total investment is the sum of

- a) $\frac{1}{2} \times$ total real estate investment per head of capacity in use,
- b) $\frac{1}{2} \times$ total feed cost per feeder,
- c) per-head feeder cost.

This product is then divided by the annual rate of turnover.

As indicated previously, the assignment of a charge for management is usually subjective and arbitrary in general situations. A common procedure used in calculating this cost is to take a percentage of gross receipts.

AN EXAMPLE COSTING

Following is an example per-head costing of a feeder

enterprise. The first step is to describe the enterprise by providing the necessary information items.

Information item no.	Item	Level
1.	Class of stock and feeding program	finishing yearling steers
2.	Beginning and ending weights, lb	650, 1,050
3.	Days on feed and annual rate of turnover	141, 2.6
4.	Energy and protein levels of basic feed, %	50, 7
5.	Price of basic feed/lb, fob feed bunk	\$0.0125
6.	Energy and protein levels of energy supplementing feed, %	80, 9
7.	Price of energy supplementing feed /lb, fob feed bunk	\$0.02
8.	Energy and protein levels of protein supplementing feed, %	83, 50
9.	Price of protein supplementing feed/lb, fob feed bunk	\$0.06
10.	Amount of basic feed required, air dry basis, lb	910
11.	Amount of energy supplementing feed required, air dry basis, lb	2,458
12.	Amount of protein supplementing feed required, air dry basis, lb	215
13.	Energy and protein levels of pasture, %	—
14.	Amount of pasture required, acres	—
15.	Price of pasture/ac	—
16.	Price of feeders at purchase/lb, fob farm	\$0.32
17.	Death loss, %	1.5
18.	Total real estate investment/head of capacity in use	\$30
19.	Annual real estate cost %	10
20.	Hourly wage rate	\$1.50
21.	Annual interest rate, %	7
22.	Management charge, % gross receipts	3
23.	Price of cattle at sale/lb, fob farm	\$0.30
24.	Amount of bedding, lb	850
25.	Price of bedding/lb, fob farm	\$0.005
26.	Method of feed handling	hay wagon
27.	Hours of labor required/head	1.3

ITEM AMOUNTS AND COSTS PER HEAD

Expense	Information item no.	Tables	Amount	Cost	% of total cost
A Basic feed	1 to 15	A16, A27, A32	910 lb	\$ 11.38	3.6
B Energy supp. feed	1 to 15	A16, A27, A32	2,458 lb	49.16	15.7
C Protein supp. feed	1 to 15	A16, A27, A32	215 lb	12.90	4.1
D Salt and mineral	—	—	—	1.50	0.5
E Vitamins and hormones	—	—	—	1.00	0.3
F Subtotal, items A-E: feed				\$ 75.94	24.2
G Real estate charge	3, 18, 19	A34, A35	—	1.15	0.4
H Feeder	2, 16			208.00	66.3
I Death loss	2, 16, 17, 23	—	—	3.12	1.0
J Veterinary, medicine	—	—	—	1.00	0.3
K Utilities, miscellaneous	—	—	—	1.30	0.4
L Bedding	24, 25	—	850 lb	4.25	1.4
M Subtotal, items G-L				\$218.82	69.8
N Labor	20, 26, 27	A36	1.6 lb	\$ 2.40	0.8
O Cost of capital	1, 4-15, 16, 18	—	—		
	$\frac{.07}{2.6} \times (1/2 \times 30 + 1/2 \times 75.94 + 208.)$			\$ 7.02	2.2
P Management	2, 22, 23	—	—	\$ 9.45	3.0
	$.03 \times 1050 \times .3$				
Total cost/feeder				\$313.63	100.0
Q Receipts, 1,050 lb steer at \$0.30/lb				\$315.00	
R Return to labor, management and capital, Q-F-M				\$ 20.24	
S Return to management and labor, R-O				\$ 13.22	
T Return to management, S-N				\$ 10.82	
U Return to capital, R-N-P				\$ 8.39	
V Return to labor, S-P				\$ 3.77	

POSSIBILITIES FOR ADJUSTMENT

In the example of feeder costing, feed and the feeder make up 24% and 66% of the total cost, respectively. The cost of the total gain (the difference between the cost of the feeder and total costs) is \$105.63. Feed makes up about 70% of the cost of gain.

Reducing feed costs appears to offer the greatest opportunity for reducing production costs. The expenses estimated for death loss, veterinary services, medicine and real estate in the example are at low levels. In real situations, these costs can become much greater. They can easily make the difference between profitable and unprofitable feeder enterprises.

The purchase price of feeder cattle is an important part of beef production costs, but only those operators

raising their own feeders have real opportunity to influence their price or cost to the feeder enterprise.

COW, CALF TO MARKET ENTERPRISE

Costings for this enterprise can be estimated by using the procedures and tables for the cow-calf and the feeder enterprises. The calf can be considered to be "sold" to the feeder enterprise. If the calf is "sold" at the cost of production calculated for the cow-calf enterprise any profit above a normal return to all inputs including labor and management will be attributed only to the feeder enterprise.

If the calf is "sold" at an estimated market value, any profits above the normal returns to all inputs including labor and management will be attributed to the two

enterprises in proportion to the contribution that each makes to the earning of those profits.

Whichever source of value is used for calves, the calf or feeder price used in estimating costs of the feeder enterprise covers all costs of the cow-calf enterprise and that this one figure is the only item common to the cost calculations for both enterprises.

Some physical items such as feed storage, manure handling equipment and buildings may be used jointly by the cow-calf and feeder enterprises. The costs arising from such items should be allocated between the two enterprises in the process of costing each of them separately, and need not be considered again for the combined enterprises.

APPENDIX 1

TABLE A1. STORED FEED REQUIREMENTS FOR GESTATING AND NURSING COWS (200-DAY WINTERING PERIOD)

Calving date	Cow weights, lb	Non-nursing ration			Nursing ration (maximum of 120 days)		
		Days on stored feed	Daily TDN requirement, lb	Total TDN ^a requirement, lb	Days on stored feed	Daily TDN requirement, lb	Total TDN ^b requirement, lb
Dec. 1	770	80	6.2	496	120	10.8	1,296
	880	80	7.0	560	120	11.7	1,404
	990	80	7.5	600	120	12.3	1,476
	1,100	80	8.4	672	120	13.2	1,584
	1,210	80	8.8	704	120	14.1	1,692
	1,320	80	9.5	760	120	15.0	1,800
Jan. 1	770	80	6.2	496	120	10.8	1,296
	880	80	7.0	560	120	11.7	1,404
	990	80	7.5	600	120	12.3	1,476
	1,100	80	8.4	672	120	13.2	1,584
	1,210	80	8.8	704	120	14.1	1,692
	1,320	80	9.5	760	120	15.0	1,800
Feb. 1	770	96	6.2	595	104	10.8	1,123
	880	96	7.0	672	104	11.7	1,217
	990	96	7.5	720	104	12.3	1,279
	1,100	96	8.4	806	104	13.2	1,373
	1,210	96	8.8	845	104	14.1	1,466
	1,320	96	9.5	912	104	15.0	1,560
Mar. 1	770	124	6.2	769	76	10.8	821
	880	124	7.0	868	76	11.7	889
	990	124	7.5	930	76	12.3	935
	1,100	124	8.4	1,042	76	13.2	1,003
	1,210	124	8.8	1,091	76	14.1	1,072
	1,320	124	9.5	1,178	76	15.0	1,140
Apr. 1	770	155	6.2	961	45	10.8	486
	880	155	7.0	1,085	45	11.7	527
	990	155	7.5	1,163	45	12.3	554
	1,100	155	8.4	1,302	45	13.2	594
	1,210	155	8.8	1,364	45	14.1	635
	1,320	155	9.5	1,473	45	15.0	675
May 1	770	185	6.2	1,147	15	10.8	162
	880	185	7.0	1,295	15	11.7	176
	990	185	7.5	1,388	15	12.3	185
	1,100	185	8.4	1,554	15	13.2	198
	1,210	185	8.8	1,628	15	14.1	212
	1,320	185	9.5	1,758	15	15.0	225

^aMinimum crude protein and TDN are 5.9% and 50%, respectively, on 100% dry-matter basis.

^bMinimum crude protein and TDN are 9.2% and 57%, respectively, on 100% dry-matter basis.

(continued)

TABLE A1. STORED FEED REQUIREMENTS FOR GESTATING AND NURSING COWS (200-DAY WINTERING PERIOD) (concluded)

Calving date	Cow weights, lb	Non-nursing ration			Nursing ration (maximum of 120 days)		
		Days on stored feed	Daily TDN requirement, lb	Total TDN ^a requirement, lb	Days on stored feed	Daily TDN requirement, lb	Total TDN ^b requirement, lb
June 1	770	200	6.2	1,240	—	—	—
	880	200	7.0	1,400	—	—	—
	990	200	7.5	1,500	—	—	—
	1,100	200	8.4	1,680	—	—	—
	1,210	200	8.8	1,760	—	—	—
	1,320	200	9.5	1,900	—	—	—

^aMinimum crude protein and TDN are 5.9% and 50%, respectively, on 100% dry-matter basis.

^bMinimum crude protein and TDN are 9.2% and 57%, respectively, on 100% dry-matter basis.

TABLE A2. FEED REQUIREMENTS OF COWS ON PASTURE^a

Calving date	Cow weights, lb	Nursing ration (maximum of 120 days)			Non-nursing ration		
		Days	Daily TDN requirements, lb	Total TDN requirements ^b , lb	Days	Daily TDN requirements, lb	Total TDN requirements ^c , lb
Dec. 1	770	—	—	—	165	6.2	1,023
	880	—	—	—	165	7.0	1,155
	990	—	—	—	165	7.5	1,238
	1,100	—	—	—	165	8.4	1,386
	1,210	—	—	—	165	8.8	1,452
	1,320	—	—	—	165	9.5	1,568
Jan. 1	770	—	—	—	165	6.2	1,023
	880	—	—	—	165	7.0	1,155
	990	—	—	—	165	7.5	1,238
	1,100	—	—	—	165	8.4	1,386
	1,210	—	—	—	165	8.8	1,452
	1,320	—	—	—	165	9.5	1,568
Feb. 1	770	16	10.8	173	149	6.2	924
	880	16	11.7	187	149	7.0	1,043
	990	16	12.3	197	149	7.5	1,118
	1,100	16	13.2	211	149	8.4	1,252
	1,210	16	14.1	226	149	8.8	1,311
	1,320	16	15.0	240	149	9.5	1,416

^aPasturing starts May 15 and goes for 165 days. Pasture grass will ordinarily contain energy and protein levels above those required by beef cows. It is necessary to ensure, however, that sufficient grass is available.

^bMinimum crude protein and TDN are 9.2% and 57%, respectively, on 100% dry-matter basis.

^cMinimum crude protein and TDN are 5.9% and 50%, respectively, on 100% dry-matter basis.

(continued)

TABLE A2. FEED REQUIREMENTS OF COWS ON PASTURE^a (concluded)

Calving date	Cow weights, lb	Nursing ration (maximum of 120 days)			Non-nursing ration		
		Days	Daily TDN requirements, lb	Total TDN requirements ^b , lb	Days	Daily TDN requirements, lb	Total TDN requirements ^c , lb
Mar. 1	770	44	10.8	475	121	6.2	750
	880	44	11.7	515	121	7.0	847
	990	44	12.3	541	121	7.5	908
	1,100	44	13.2	581	121	8.4	1,016
	1,210	44	14.1	620	121	8.8	1,065
	1,320	44	15.0	660	121	9.5	1,150
Apr. 1	770	75	10.8	810	90	6.2	558
	880	75	11.7	878	90	7.0	630
	990	75	12.3	923	90	7.5	675
	1,100	75	13.2	990	90	8.4	756
	1,210	75	14.1	1,058	90	8.8	792
	1,320	75	15.0	1,125	90	9.5	855
May 1	770	105	10.8	1,134	60	6.2	372
	880	105	11.7	1,229	60	7.0	420
	990	105	12.3	1,292	60	7.5	450
	1,100	105	13.2	1,386	60	8.4	504
	1,210	105	14.1	1,481	60	8.8	528
	1,320	105	15.0	1,575	60	9.5	570
June 1	770	120	10.8	1,296	45	6.2	279
	880	120	11.7	1,404	45	7.0	315
	990	120	12.3	1,476	45	7.5	338
	1,100	120	13.2	1,584	45	8.4	378
	1,210	120	14.1	1,692	45	8.8	396
	1,320	120	15.0	1,800	45	9.5	428

^aPasturing starts May 15 and goes for 165 days. Pasture grass will ordinarily contain energy and protein levels above those required by beef cows. It is necessary to ensure, however, that sufficient grass is available.

^bMinimum crude protein and TDN are 9.2% and 57%, respectively, on 100% dry-matter basis.

^cMinimum crude protein and TDN are 5.9% and 50%, respectively, on 100% dry-matter basis.

TABLE A3. POUNDS OF FEED REQUIRED^a TO PROVIDE VARIOUS AMOUNTS OF TDN, FOR FEEDS OF DIFFERING TDN LEVELS

% TDN of feed ^b	Amount of TDN (lb)																
	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1,000
50 ^c	400	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800	1,900	2,000
52	385	481	577	673	769	865	962	1,058	1,154	1,250	1,346	1,442	1,538	1,635	1,731	1,827	1,923
54	370	463	556	648	740	833	926	1,019	1,111	1,204	1,296	1,389	1,482	1,574	1,667	1,759	1,852
56	357	446	536	625	714	804	893	982	1,071	1,161	1,250	1,339	1,429	1,518	1,607	1,696	1,786
57 ^d	351	439	526	614	702	789	877	965	1,053	1,140	1,228	1,316	1,404	1,491	1,579	1,667	1,754
58	345	431	517	603	690	776	862	948	1,034	1,121	1,207	1,293	1,379	1,464	1,552	1,638	1,724
60	333	417	500	583	667	750	833	917	1,000	1,083	1,167	1,250	1,333	1,417	1,500	1,583	1,667
62	323	403	484	565	645	726	807	885	968	1,048	1,129	1,210	1,290	1,371	1,452	1,532	1,613
64	313	391	469	547	625	703	781	859	938	1,016	1,094	1,172	1,250	1,328	1,406	1,484	1,563
66	303	379	455	530	606	682	758	833	909	985	1,061	1,136	1,212	1,288	1,364	1,439	1,515
68	294	368	441	515	588	662	735	809	882	956	1,029	1,103	1,176	1,250	1,324	1,397	1,471
70	286	357	429	500	571	643	714	786	857	929	1,000	1,074	1,143	1,214	1,286	1,357	1,429
72	278	347	417	486	556	625	694	764	833	903	972	1,042	1,111	1,181	1,250	1,319	1,389
74	270	338	405	473	541	608	676	743	811	878	946	1,014	1,081	1,148	1,216	1,284	1,351
76	263	329	395	461	526	592	658	724	789	855	921	987	1,053	1,118	1,184	1,250	1,316
78	256	320	385	449	513	577	641	705	769	833	897	962	1,026	1,090	1,154	1,218	1,282
80	250	312	375	438	500	562	625	688	750	812	875	938	1,000	1,062	1,125	1,188	1,250

% TDN of feed	1,050	1,100	1,150	1,200	1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600	1,650	1,700	1,750	1,800
50 ^c	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600
52	2,019	2,115	2,212	2,308	2,404	2,500	2,596	2,692	2,788	2,885	2,981	3,077	3,173	3,269	3,365	3,462
54	1,944	2,037	2,130	2,222	2,315	2,407	2,500	2,593	2,685	2,778	2,870	2,963	3,056	3,148	3,241	3,333
56	1,875	1,964	2,054	2,143	2,232	2,321	2,411	2,500	2,589	2,679	2,768	2,857	2,946	3,036	3,125	3,214
57 ^d	1,842	1,930	2,018	2,105	2,193	2,281	2,368	2,456	2,544	2,632	2,719	2,807	2,895	2,982	3,070	3,158
58	1,810	1,897	1,983	2,069	2,155	2,241	2,328	2,414	2,500	2,586	2,672	2,759	2,845	2,931	3,017	3,103
60	1,750	1,833	1,917	2,000	2,083	2,167	2,250	2,333	2,417	2,500	2,583	2,667	2,750	2,833	2,917	3,000
62	1,694	1,774	1,855	1,936	2,016	2,097	2,177	2,258	2,339	2,419	2,500	2,581	2,661	2,742	2,823	2,903
64	1,641	1,719	1,797	1,875	1,953	2,031	2,109	2,188	2,266	2,344	2,422	2,500	2,578	2,656	2,734	2,813
66	1,591	1,667	1,742	1,818	1,894	1,970	2,045	2,121	2,197	2,273	2,348	2,424	2,500	2,576	2,652	2,727
68	1,544	1,618	1,691	1,765	1,838	1,912	1,985	2,059	2,132	2,206	2,279	2,353	2,426	2,500	2,574	2,647
70	1,500	1,571	1,643	1,714	1,786	1,857	1,929	2,000	2,071	2,143	2,214	2,286	2,357	2,429	2,500	2,571
72	1,458	1,528	1,597	1,667	1,736	1,806	1,875	1,944	2,014	2,083	2,153	2,222	2,292	2,361	2,431	2,500
74	1,419	1,486	1,554	1,622	1,689	1,757	1,824	1,892	1,959	2,027	2,095	2,162	2,230	2,297	2,365	2,432
76	1,382	1,447	1,513	1,579	1,645	1,711	1,776	1,842	1,908	1,974	2,039	2,105	2,171	2,237	2,303	2,369
78	1,346	1,410	1,474	1,538	1,603	1,667	1,731	1,795	1,859	1,923	1,987	2,051	2,115	2,179	2,244	2,308
80	1,312	1,375	1,438	1,500	1,562	1,625	1,688	1,750	1,812	1,875	1,938	2,000	2,062	2,125	2,188	2,250

Note: Limit feeding of feeds having TDN levels above the specified minimums will be necessary for greatest feed economy.

a,b 100% dry-matter basis.

^cMinimum TDN level for dry, pregnant, mature cows.

^dMinimum TDN level for nursing cows, 3 to 4 months after calving.

Example: 950 lb of TDN can be supplied by 1,532 lb of feed having a TDN level of 62%.

TABLE A4. PROPORTIONS OF ENERGY SUPPLEMENTING FEEDS NECESSARY TO RAISE TDN LEVELS OF BASIC FEEDS TO MINIMUM LEVEL FOR DRY PREGNANT MATURE COWS (50% ON 100% DRY-MATTER BASIS).

% TDN of basic feed ^a	% TDN of energy supplementing feeds ^a													
	55	56	57	58	59	60	61	62	63	64	65	70	75	80
40	.67	.63	.59	.56	.53	.50	.48	.45	.43	.42	.40	.33	.29	.25
41	.64	.60	.56	.53	.50	.47	.45	.43	.41	.39	.38	.31	.26	.23
42	.62	.57	.53	.50	.47	.44	.42	.40	.38	.36	.35	.29	.24	.21
43	.58	.54	.50	.47	.44	.41	.39	.37	.35	.33	.32	.26	.22	.19
44	.55	.50	.46	.43	.40	.38	.35	.33	.32	.30	.29	.23	.19	.17
45	.50	.45	.42	.38	.36	.33	.31	.29	.28	.26	.25	.20	.17	.14
46	.44	.40	.36	.33	.31	.29	.27	.25	.24	.22	.21	.17	.14	.12
47	.38	.33	.30	.27	.25	.23	.21	.20	.19	.18	.17	.13	.11	.09
48	.29	.25	.22	.20	.18	.17	.15	.14	.13	.13	.12	.09	.07	.06
49	.17	.14	.13	.11	.10	.09	.08	.08	.07	.07	.06	.05	.04	.03

^aOn 100% dry-matter basis.

Example: Oat straw at 44% TDN and barley at 80% TDN are to be fed. This table indicates a ration composed of 0.17 barley and 0.83 oat straw (by inference) will meet the minimum requirement of 50%.

TABLE A5. PROPORTIONS OF PROTEIN SUPPLEMENTING FEEDS NECESSARY TO RAISE CRUDE PROTEIN LEVELS OF BASIC FEEDS TO MINIMUM LEVEL FOR DRY MATURE PREGNANT COWS (5.9% ON 100% DRY-MATTER BASIS)

% C.P. of basic feed ^a	% C.P. of protein supplementing feeds ^a								
	10	15	20	25	30	35	40	45	50
4.0	.317	.173	.119	.090	.073	.061	.053	.046	.041
4.2	.293	.157	.108	.082	.066	.055	.047	.042	.037
4.4	.268	.142	.096	.073	.059	.049	.042	.037	.033
4.6	.241	.125	.084	.064	.051	.043	.037	.032	.029
4.8	.212	.108	.072	.054	.043	.036	.031	.027	.024
5.0	.180	.090	.060	.045	.036	.030	.026	.023	.020
5.2	.167	.082	.054	.040	.032	.027	.023	.020	.018
5.4	.130	.063	.041	.031	.024	.020	.017	.015	.013
5.6	.091	.043	.028	.021	.016	.014	.012	.010	.009
5.8	.048	.022	.014	.010	.008	.007	.006	.005	.005

^aOn 100% dry-matter basis.

Example: Oat straw at 4.4% crude protein and alfalfa hay at 15% crude protein are to be fed. This table indicates a ration composed of .142 alfalfa hay and .858 oat straw (by inference) will meet the minimum requirement of 5.9%.

TABLE A6. PROPORTIONS OF ENERGY SUPPLEMENTING FEEDS NECESSARY TO RAISE TDN LEVELS OF BASIC FEEDS TO MINIMUM LEVEL FOR NURSING COWS (57% ON 100% DRY-MATTER BASIS)

% TDN of basic feed ^a	% TDN of energy supplementing feeds ^a													
	62	63	64	65	66	67	68	69	70	72	74	76	78	80
40	.77	.74	.71	.68	.65	.63	.61	.59	.57	.53	.50	.47	.45	.43
41	.76	.73	.70	.67	.64	.62	.59	.57	.55	.52	.48	.46	.43	.41
42	.75	.71	.68	.65	.63	.60	.58	.56	.54	.50	.47	.44	.42	.39
43	.74	.70	.67	.64	.61	.58	.56	.54	.52	.48	.45	.42	.40	.38
44	.72	.68	.65	.62	.59	.57	.54	.52	.50	.46	.43	.41	.38	.36
45	.71	.67	.63	.60	.57	.55	.52	.50	.48	.44	.41	.39	.36	.34
46	.69	.65	.61	.58	.55	.52	.50	.48	.46	.42	.39	.37	.34	.32
47	.67	.63	.59	.56	.53	.50	.48	.45	.43	.40	.37	.34	.32	.30
48	.64	.60	.56	.53	.50	.47	.45	.43	.41	.38	.35	.32	.30	.28
49	.62	.57	.53	.50	.47	.44	.42	.40	.38	.35	.32	.30	.28	.26
50	.58	.54	.50	.47	.44	.41	.39	.37	.35	.32	.29	.27	.25	.23
51	.55	.50	.46	.43	.40	.38	.35	.33	.32	.29	.26	.24	.22	.21
52	.50	.45	.42	.38	.36	.33	.31	.29	.28	.25	.23	.21	.19	.18
53	.44	.40	.36	.33	.31	.29	.27	.25	.24	.21	.19	.17	.16	.15
54	.38	.33	.30	.27	.25	.23	.21	.20	.19	.17	.15	.14	.13	.12
55	.29	.25	.22	.20	.18	.17	.15	.14	.13	.12	.11	.10	.09	.08
56	.17	.14	.13	.11	.10	.09	.08	.08	.07	.06	.06	.05	.05	.04

^aOn 100% dry-matter basis.

Example: Hay at 50% TDN and barley at 80% TDN are to be fed. This table indicates that a ration composed of 0.23 barley and 0.77 hay (by inference) will meet the minimum requirement of 57%.

TABLE A7. PROPORTIONS OF PROTEIN SUPPLEMENTING FEEDS NECESSARY TO RAISE CRUDE PROTEIN LEVELS OF BASIC FEEDS TO MINIMUM LEVEL FOR NURSING COWS (9.2% ON 100% DRY-MATTER BASIS)

% C.P. of basic feed ^a	% C.P. of protein supplementing feeds ^a							
	15	20	25	30	35	40	45	50
4.0	.473	.325	.248	.200	.168	.144	.127	.113
4.2	.463	.316	.240	.194	.162	.140	.123	.109
4.4	.453	.308	.233	.188	.157	.135	.118	.105
4.6	.442	.299	.225	.181	.151	.130	.114	.101
4.8	.431	.289	.218	.175	.146	.125	.109	.097
5.0	.420	.280	.210	.168	.140	.120	.105	.093
5.2	.408	.270	.202	.161	.134	.115	.102	.089
5.4	.396	.260	.194	.154	.128	.110	.096	.085
5.6	.383	.250	.186	.148	.122	.105	.091	.081
5.8	.370	.239	.177	.140	.116	.099	.087	.077
6.0	.356	.229	.168	.133	.110	.094	.082	.073
6.2	.341	.217	.160	.126	.104	.089	.077	.068
6.4	.326	.209	.151	.119	.098	.083	.073	.064
6.6	.310	.194	.141	.111	.092	.078	.068	.060
6.8	.293	.182	.132	.103	.085	.072	.063	.056
7.0	.275	.169	.122	.096	.079	.067	.058	.051
7.2	.256	.156	.112	.088	.072	.061	.053	.047
7.4	.237	.143	.102	.080	.065	.055	.048	.042
7.6	.216	.129	.092	.071	.058	.049	.043	.038
7.8	.194	.115	.081	.063	.051	.043	.038	.033
8.0	.171	.100	.071	.055	.044	.038	.032	.029
8.2	.147	.085	.060	.046	.037	.031	.027	.024
8.4	.121	.069	.048	.037	.030	.025	.022	.019
8.6	.093	.053	.037	.028	.023	.019	.016	.014
8.8	.065	.036	.025	.019	.015	.013	.011	.010
9.0	.033	.018	.013	.010	.008	.006	.006	.005

^aOn 100% dry-matter basis.

Example: Grass hay at 7% crude protein and alfalfa hay at 15% crude protein are to be fed. This table indicates that a ration composed of .275 alfalfa hay and .725 grass hay will meet the minimum requirement of 9.2%.

TABLE A8. BULL FEED^a (GROWTH AND MAINTENANCE)

Bull weight (ADG) ^b lb	Total annual feed, lb	Annual TDN requirement, lb	Minimum percentage	
			TDN	C.P.
1,100 (1.54)	9,502	5,701	60	13.3
1,320 (1.10)	9,235	5,541	60	12.2
1,540 (0.66)	10,144	5,782	57	11.1
1,760 (0.00)	7,889	4,497	57	10.0
1,980 (0.00)	8,593	4,898	57	10.0

^aOn 100% dry-matter basis.^bAverage daily gain.

TABLE A9. PROPORTIONS OF ENERGY SUPPLEMENTING FEEDS NECESSARY TO RAISE TDN LEVELS OF BASIC FEEDS TO MINIMUM LEVELS FOR YOUNG GROWING BULLS (60% ON 100% DRY-MATTER BASIS)

% TDN basic feed ^a	65	66	67	68	69	70	72	74	76	78	80
40	.80	.77	.74	.71	.69	.67	.63	.59	.56	.53	.50
41	.79	.76	.73	.70	.68	.66	.61	.58	.54	.51	.49
42	.78	.75	.72	.69	.67	.64	.60	.56	.53	.50	.47
43	.77	.74	.71	.68	.65	.63	.59	.55	.52	.49	.46
44	.76	.73	.70	.67	.64	.62	.57	.53	.50	.47	.44
45	.75	.71	.68	.65	.63	.60	.56	.52	.48	.46	.43
46	.74	.70	.67	.64	.61	.58	.54	.50	.47	.44	.41
47	.72	.68	.65	.62	.59	.57	.52	.48	.45	.42	.39
48	.71	.67	.63	.60	.57	.55	.50	.46	.43	.40	.38
49	.69	.65	.61	.58	.55	.52	.48	.44	.41	.38	.36
50	.67	.63	.59	.56	.53	.50	.46	.42	.39	.36	.33
51	.64	.60	.56	.53	.50	.47	.43	.39	.36	.33	.31
52	.62	.57	.53	.50	.47	.44	.40	.36	.33	.31	.29
53	.58	.54	.50	.47	.44	.41	.37	.33	.30	.28	.26
54	.55	.50	.46	.43	.40	.38	.33	.30	.27	.25	.23
55	.50	.46	.42	.39	.36	.33	.29	.26	.24	.22	.20
56	.44	.40	.36	.33	.31	.29	.25	.22	.20	.18	.17
57	.38	.33	.30	.27	.25	.23	.20	.18	.16	.14	.13
58	.29	.25	.22	.20	.18	.17	.14	.13	.11	.10	.09
59	.17	.14	.13	.11	.10	.09	.08	.07	.06	.05	.05

^aOn 100% dry-matter basis.

TABLE A10. PROPORTIONS OF PROTEIN SUPPLEMENTING FEEDS NECESSARY TO RAISE CRUDE PROTEIN LEVEL OF BASIC FEEDS TO MINIMUM LEVEL FOR BULLS AVERAGING 1,100 LBS (13.3% ON 100% DRY-MATTER BASIS)

% C.P. of basic feed ^a	% C.P. of protein supplementing feeds ^a							
	15	20	25	30	35	40	45	50
7.0	.788	.485	.350	.274	.225	.191	.166	.147
7.2	.782	.477	.343	.268	.219	.186	.161	.143
7.4	.776	.468	.335	.261	.214	.181	.157	.138
7.6	.770	.459	.328	.254	.208	.176	.152	.134
7.8	.764	.451	.320	.248	.202	.171	.148	.130
8.0	.757	.442	.312	.241	.196	.166	.143	.126
8.2	.750	.432	.304	.234	.190	.160	.139	.122
8.4	.742	.422	.295	.227	.184	.155	.134	.118
8.6	.734	.412	.287	.220	.178	.150	.129	.114
8.8	.726	.402	.278	.212	.172	.144	.124	.109
9.0	.717	.391	.269	.205	.165	.139	.119	.105
9.2	.707	.380	.259	.197	.159	.133	.115	.100
9.4	.696	.368	.250	.189	.152	.127	.110	.096
9.6	.685	.356	.240	.181	.146	.122	.105	.092
9.8	.673	.343	.230	.173	.139	.116	.099	.087
10.0	.660	.330	.220	.165	.132	.110	.094	.083
10.2	.646	.316	.209	.157	.125	.104	.089	.078
10.4	.630	.302	.199	.148	.118	.098	.084	.073
10.6	.614	.287	.188	.139	.111	.092	.078	.069
10.8	.595	.272	.176	.130	.103	.086	.073	.064
11.0	.575	.256	.164	.121	.096	.079	.068	.059
11.2	.553	.239	.152	.112	.088	.073	.062	.054
11.4	.528	.221	.140	.102	.081	.066	.057	.049
11.6	.500	.202	.127	.092	.073	.060	.051	.044
11.8	.469	.183	.114	.082	.065	.053	.045	.039
12.0	.433	.163	.100	.072	.057	.046	.039	.034
12.2	.392	.141	.086	.062	.048	.040	.034	.029
12.4	.346	.118	.071	.051	.040	.033	.028	.024
12.6	.292	.095	.056	.040	.031	.026	.022	.019
12.8	.227	.069	.041	.029	.023	.018	.016	.013
13.0	.150	.043	.025	.018	.014	.011	.009	.008
13.2	.056	.015	.008	.006	.005	.004	.003	.003

^aOn 100% dry-matter basis.

TABLE A11. ANNUAL COST OF BULL FEED ON A PER-COW BASIS

Feed cost /bull	14	16	18	20	22	24	26	28	30	32	34	36	38	40
\$ 50	3.57	3.13	2.78	2.50	2.27	2.08	1.92	1.79	1.67	1.56	1.47	.139	1.32	1.25
60	4.29	3.75	3.33	3.00	2.73	2.50	2.31	2.14	2.00	1.88	1.76	1.67	1.58	1.50
70	5.00	4.38	3.89	3.50	3.18	2.92	2.69	2.50	2.33	2.19	2.06	1.94	1.84	1.75
80	5.71	5.00	4.44	4.00	3.64	3.33	3.08	2.86	2.67	2.50	2.35	2.22	2.11	2.00
90	6.43	5.63	5.00	4.50	4.09	3.75	3.46	3.21	3.00	2.81	2.65	2.50	2.37	2.25
100	7.14	6.25	5.56	5.00	4.55	4.17	3.85	3.57	3.33	3.13	2.94	2.78	2.63	2.50
110	7.86	6.88	6.11	5.50	5.00	4.58	4.23	3.93	3.67	3.44	3.24	3.06	2.89	2.75
120	8.57	7.50	6.67	6.00	5.45	5.00	4.62	4.29	4.00	3.75	3.53	3.33	3.16	3.00
130	9.29	8.13	7.22	6.50	5.91	5.42	5.00	4.64	4.33	4.06	3.82	3.61	3.42	3.25
140	10.00	8.75	7.78	7.00	6.36	5.83	5.38	5.00	4.67	4.38	4.12	3.89	3.68	3.50
150	10.71	9.38	8.33	7.50	6.82	6.25	5.77	5.36	5.00	4.69	4.41	4.17	3.95	3.75
160	11.43	10.00	8.89	8.00	7.27	6.67	6.15	5.71	5.33	5.00	4.71	4.44	4.21	4.00
170	12.14	10.63	9.44	8.50	7.73	7.08	6.54	6.07	5.67	5.31	5.00	4.72	4.47	4.25
180	12.86	11.25	10.00	9.00	8.18	7.50	6.92	6.43	6.00	5.63	5.29	5.00	4.74	4.50
190	13.57	11.88	10.56	9.50	8.64	7.92	7.31	6.79	6.33	5.94	5.59	5.28	5.00	4.75
200	14.29	12.50	11.11	10.00	9.09	8.33	7.69	7.14	6.67	6.25	5.88	5.56	5.26	5.00
210	15.00	13.13	11.67	10.50	9.55	8.75	8.08	7.50	7.00	6.56	6.18	5.83	5.53	5.25
220	15.71	13.75	12.22	11.00	10.00	9.17	8.46	7.86	7.33	6.88	6.47	6.11	5.79	5.50
230	16.43	14.38	12.78	11.50	10.45	9.58	8.85	8.21	7.67	7.19	6.76	6.39	6.05	5.75
240	17.14	15.00	13.33	12.00	10.91	10.00	9.23	8.57	8.00	7.50	7.06	6.67	6.32	6.00
250	17.86	15.63	13.89	12.50	11.36	10.42	9.62	8.93	8.33	7.81	7.35	6.94	6.58	6.25
260	18.57	16.25	14.44	13.00	11.82	10.83	10.00	9.29	8.67	8.13	7.65	7.22	6.84	6.50
270	19.29	16.88	15.00	13.50	12.27	11.25	10.38	9.64	9.00	8.44	7.94	7.50	7.11	6.75
280	20.00	17.50	15.56	14.00	12.73	11.67	10.77	10.00	9.33	8.75	8.24	7.78	7.37	7.00
290	20.71	18.13	16.11	14.50	13.18	12.08	11.15	10.36	9.67	9.06	8.53	8.06	7.63	7.25
300	21.43	18.75	16.67	15.00	13.64	12.50	11.54	10.71	10.00	9.38	8.82	8.33	7.89	7.50

TABLE A12. ANNUAL COW DEPRECIATION

Total cow depreciation ^a	Expected years of service life								
	2	3	4	5	6	7	8	9	10
\$ 10	\$ 5.00	\$ 3.33	\$ 2.50	\$ 2.00	\$ 1.66	\$ 1.42	\$ 1.25	\$ 1.11	\$ 1.00
30	15.00	10.00	7.50	6.00	5.00	4.28	3.75	3.33	3.00
50	25.00	16.66	12.50	10.00	8.33	7.14	6.25	5.55	5.00
70	35.00	23.33	17.50	14.00	11.66	10.00	8.75	7.77	7.00
90	45.00	30.00	22.50	18.00	15.00	12.85	11.25	10.00	9.00
110	55.00	36.66	27.50	22.00	18.33	15.71	13.75	12.22	11.00
130	65.00	43.33	32.50	26.00	21.66	18.57	16.25	14.44	13.00
150	75.00	50.00	37.50	30.00	25.00	21.42	18.75	16.66	15.00
170	85.00	56.66	42.50	34.00	28.33	24.28	21.25	18.88	17.00
190	95.00	63.33	47.50	38.00	31.66	27.14	23.75	21.11	19.00
210	105.00	70.00	52.50	42.00	35.00	30.00	26.25	23.33	21.00
230	115.00	76.66	57.50	46.00	38.33	32.85	28.75	25.55	23.00
250	125.00	83.33	62.50	50.00	41.66	35.71	31.25	27.77	25.00
270	135.00	90.00	67.50	54.00	45.00	38.57	33.75	30.00	27.00
290	145.00	96.66	72.50	58.00	48.33	41.42	36.25	32.22	29.00
310	155.00	103.33	77.50	62.00	51.66	44.28	38.75	34.44	31.00
330	165.00	110.00	82.50	66.00	55.00	47.14	41.25	36.66	33.00
350	175.00	116.66	87.50	70.00	58.33	50.00	43.75	38.88	35.00
370	185.00	123.33	92.50	74.00	61.66	52.85	46.25	41.11	37.00
390	195.00	130.00	97.50	78.00	65.00	55.71	48.75	43.33	39.00
410	205.00	136.66	102.50	82.00	68.33	58.57	51.25	45.55	41.00

^aTotal cow depreciation (\$) = initial value - cull value (1 + death loss proportion)

TABLE A13. ANNUAL BULL DEPRECIATION ON PER-COW BASIS

Bull service life (years)	Total bull depre- ciation	Cow/bull ratio													
		14	16	18	20	22	24	26	28	30	32	34	36	38	40
2	\$100	\$ 3.57	\$ 3.13	\$ 2.78	\$ 2.50	\$ 2.27	\$ 2.08	\$ 1.92	\$ 1.79	\$ 1.67	\$ 1.56	\$ 1.47	\$ 1.39	\$ 1.32	\$ 1.25
	200	7.14	6.25	5.56	5.00	4.55	4.17	3.85	3.57	3.33	3.13	2.94	2.78	2.63	2.50
	300	10.71	9.38	8.33	7.50	6.82	6.25	5.77	5.36	5.00	4.69	4.41	4.17	3.95	3.75
	400	14.28	12.50	11.11	10.00	9.09	8.33	7.69	7.14	6.67	6.25	5.88	5.56	5.26	5.00
	500	17.85	15.63	13.89	12.50	11.36	10.42	9.62	8.93	8.33	7.81	7.35	6.94	6.57	6.25
	600	21.42	18.75	16.67	15.00	13.64	12.50	11.54	10.71	10.00	9.38	8.82	8.33	7.89	7.50
	700	25.00	21.88	19.44	17.50	15.91	14.58	13.46	12.50	11.67	10.94	10.29	9.72	9.21	8.75
	800	28.57	25.00	22.22	20.00	18.18	16.67	15.38	14.29	13.33	12.50	11.76	11.11	10.53	10.00
3	100	2.38	2.08	1.85	1.67	1.51	1.39	1.28	1.19	1.11	1.04	.98	.93	.88	.83
	200	4.76	4.17	3.70	3.34	3.03	2.78	2.57	2.38	2.22	2.08	1.96	1.85	1.76	1.67
	300	7.14	6.25	5.56	5.00	4.55	4.17	3.85	3.57	3.33	3.13	2.94	2.78	2.63	2.50
	400	9.52	8.33	7.41	6.67	6.06	5.56	5.13	4.76	4.44	4.17	3.92	3.70	3.51	3.33
	500	11.90	10.42	9.26	8.33	7.58	6.94	6.41	5.95	5.56	5.21	4.90	4.63	4.39	4.17
	600	14.29	12.50	11.11	10.00	9.09	8.33	7.69	7.14	6.67	6.25	5.88	5.56	5.26	5.00
	700	16.67	14.58	12.96	11.67	10.61	9.72	8.97	8.33	7.78	7.29	6.86	6.48	6.14	5.83
	800	19.05	16.67	14.81	13.33	12.12	11.11	10.26	9.52	8.89	8.33	7.84	7.41	7.02	6.67
4	100	1.79	1.56	1.39	1.25	1.14	1.04	.96	.89	.83	.78	.74	.69	.66	.63
	200	3.57	3.13	2.78	2.50	2.27	2.08	1.92	1.79	1.67	1.56	1.47	1.39	1.32	1.25
	300	5.36	4.69	4.17	3.75	3.41	3.13	2.88	2.68	2.50	2.34	2.21	2.08	1.97	1.88
	400	7.14	6.25	5.56	5.00	4.55	4.17	3.85	3.57	3.33	3.13	2.94	2.78	2.63	2.50
	500	8.93	7.81	6.94	6.25	5.68	5.21	4.81	4.46	4.17	3.91	3.68	3.47	3.29	3.13
	600	10.71	9.38	8.33	7.50	6.82	6.25	5.77	5.36	5.00	4.69	4.41	4.17	3.95	3.75
	700	12.50	10.94	9.72	8.75	7.95	7.29	6.73	6.25	5.83	5.47	5.15	4.86	4.61	4.38
	800	14.29	12.50	11.11	10.00	9.09	8.33	7.69	7.14	6.67	6.25	5.88	5.56	5.26	5.00
5	100	1.43	1.25	1.11	1.00	.91	.83	.77	.71	.67	.63	.59	.56	.53	.50
	200	2.86	2.50	2.22	2.00	1.82	1.67	1.54	1.43	1.33	1.25	1.18	1.11	1.05	1.00
	300	4.29	3.75	3.33	3.00	2.73	2.50	2.31	2.14	2.00	1.88	1.76	1.67	1.58	1.50
	400	5.71	5.00	4.44	4.00	3.64	3.33	3.08	2.86	2.67	2.50	2.35	2.22	2.11	2.00
	500	7.14	6.25	5.56	5.00	4.55	4.17	3.85	3.57	3.33	3.13	2.94	2.78	2.63	2.50
	600	8.57	7.50	6.67	6.00	5.45	5.00	4.62	4.29	4.00	3.75	3.53	3.33	3.16	3.00
	700	10.00	8.75	7.78	7.00	6.36	5.83	5.38	5.00	4.67	4.38	4.12	3.89	3.68	3.50
	800	11.43	10.00	8.89	8.00	7.27	6.67	6.15	5.71	5.33	5.00	4.71	4.44	4.21	4.00

TABLE A14. ANNUAL REAL ESTATE COST PER COW

Total real estate investment/cow ^a	Annual real estate cost %						
	8	10	12	14	16	18	20
\$ 20	\$ 1.60	\$ 2.00	\$ 2.40	\$ 2.80	\$ 3.20	\$ 3.60	\$ 4.00
40	3.20	4.00	4.80	5.60	6.40	7.20	8.00
60	4.80	6.00	7.20	8.40	9.60	10.80	12.00
80	6.40	8.00	9.60	11.20	12.80	14.40	16.00
100	8.00	10.00	12.00	14.00	16.00	18.00	20.00
120	9.60	12.00	14.40	16.80	19.20	21.60	24.00
140	11.20	14.00	16.80	19.60	22.40	25.20	28.00
160	12.80	16.00	19.20	22.40	25.60	28.80	32.00
180	14.40	18.00	21.60	25.20	28.80	32.40	36.00
200	16.00	20.00	24.00	28.00	32.00	36.00	40.00
220	17.60	22.00	26.40	30.80	35.20	39.60	44.00
240	19.20	24.00	28.80	33.60	38.40	43.20	48.00
260	20.80	26.00	31.20	36.40	41.60	46.80	52.00
280	22.40	28.00	33.60	39.20	44.80	50.40	56.00
300	24.00	30.00	36.00	42.00	48.00	54.00	60.00

^aTotal investment includes structures, pens, watering and feeding facilities and manure storage.

TABLE A15. PROGRAMS FOR FINISHING STEER CALVES

Beginning weight, lb.	Ending weight, lb.	Total gain, lb.	Av daily gain, lb.	Days on feed	Total TDN, lb.	Total crude protein, lb.	Minimum percentage	
							TDN	C.P.
300	950	650	2.30	283	2,996	478	74	12.0
300	1,000	700	2.30	305	3,326	528	74	12.0
300	1,050	750	2.29	327	3,657	579	74	11.5
350	950	600	2.32	258	2,848	454	74	12.0
350	1,000	650	2.32	280	3,175	503	74	11.5
350	1,050	700	2.33	301	3,507	553	74	11.5
400	950	550	2.35	234	2,687	427	74	12.0
400	1,000	600	2.35	255	3,014	476	74	11.5
400	1,050	650	2.36	276	3,346	526	74	11.5
450	950	500	2.38	210	2,497	397	74	11.5
450	1,000	550	2.37	232	2,829	446	74	11.5
450	1,050	600	2.36	254	3,161	496	74	11.5
500	950	450	2.39	188	2,312	366	74	11.5
500	1,000	500	2.39	209	2,639	415	74	11.5
500	1,050	550	2.38	231	2,970	465	74	11.5
550	950	400	2.42	165	2,126	335	74	11.5
550	1,000	450	2.41	187	2,453	385	74	11.5
550	1,050	500	2.40	208	2,785	435	74	11.5
600	950	350	2.41	145	1,891	296	74	11.5
600	1,000	400	2.41	166	2,218	346	74	11.5
600	1,050	450	2.39	188	2,550	395	74	11.5
650	950	300	2.42	124	1,651	257	74	11.5
650	1,000	350	2.41	145	1,978	306	74	11.5
650	1,050	400	2.40	167	2,309	356	74	11.5

TABLE A16. PROGRAMS FOR FINISHING YEARLING STEERS

Beginning weight, lb	Ending weight, lb	Total gain, lb	Av daily gain, lb	Days on feed	Total TDN, lb.	Total crude protein, lb.	Minimum percentage	
							TDN	C.P.
500	950	450	2.87	157	2,203	339	72	11
500	1,000	500	2.86	175	2,500	384	72	11
500	1,050	550	2.85	193	2,845	438	72	11
500	1,100	600	2.83	212	3,190	491	72	11
550	950	400	2.86	140	2,003	308	72	11
550	1,000	450	2.87	157	2,300	354	72	11
550	1,050	500	2.84	176	2,645	407	72	11
550	1,100	550	2.82	195	2,991	460	72	11
600	950	350	2.87	122	1,804	277	72	11
600	1,000	400	2.86	140	2,100	323	72	11
600	1,050	450	2.83	159	2,445	376	72	11
600	1,100	500	2.82	177	2,791	429	72	11
650	950	300	2.86	105	1,576	242	72	11
650	1,000	350	2.87	122	1,873	288	72	11
650	1,050	400	2.84	141	2,218	341	72	11
650	1,100	450	2.81	160	2,563	395	72	11
700	950	250	2.87	87	1,346	207	72	11
700	1,000	300	2.86	105	1,642	253	72	11
700	1,050	350	2.82	124	1,988	306	72	11
700	1,100	400	2.80	143	2,333	359	72	11
750	950	200	2.86	70	1,115	172	72	11
750	1,000	250	2.87	87	1,412	217	72	11
750	1,050	300	2.83	106	1,757	271	72	11
750	1,100	350	2.80	125	2,102	324	72	11

TABLE A17. PROGRAMS FOR FINISHING 2-YEAR-OLD STEERS

Beginning weight, lb	Ending weight, lb	Total gain, lb	Av daily gain, lb	Days on feed	Total TDN, lb	Total crude protein, lb	Minimum percentage	
							TDN	C.P.
750	1,000	250	3.09	81	1,400	219	71	11
750	1,050	300	3.09	97	1,739	272	71	11
750	1,100	350	3.10	113	2,078	325	71	11
750	1,150	400	3.08	130	2,417	378	71	11
750	1,200	450	3.06	147	2,786	436	71	11
800	1,000	200	3.08	65	1,140	178	71	11
800	1,050	250	3.09	81	1,479	231	71	11
800	1,100	300	3.09	97	1,818	284	71	11
800	1,150	350	3.10	113	2,156	338	71	11
800	1,200	400	3.05	131	2,525	395	71	11
850	1,000	150	3.06	49	867	136	71	11
850	1,050	200	3.08	65	1,206	189	71	11
850	1,100	250	3.09	81	1,545	242	71	11
850	1,150	300	3.09	97	1,883	295	71	11
850	1,200	350	3.04	115	2,253	353	71	11

TABLE A18. PROGRAMS FOR FINISHING HEIFER CALVES

Beginning weight, lb	Ending weight, lb	Total gain, lb	Av Daily gain, lb	Days on feed	Total TDN, lb	Total crude protein, lb	Minimum percentage	
							TDN	C.P.
300	850	550	2.04	270	2,698	438	74	12.0
300	900	600	2.04	294	3,035	489	74	12.0
300	950	650	2.04	318	3,373	540	74	12.0
350	850	500	2.07	242	2,529	410	74	12.0
350	900	550	2.07	266	2,866	461	74	12.0
350	950	600	2.07	290	3,204	512	74	12.0
400	850	450	2.10	214	2,349	380	74	12.0
400	900	500	2.10	238	2,686	431	74	12.0
400	950	550	2.10	262	3,024	482	74	12.0
450	850	400	2.12	189	2,143	346	74	12.0
450	900	450	2.11	213	2,480	397	74	12.0
450	950	500	2.11	237	2,818	448	74	12.0
500	850	350	2.13	164	1,937	312	74	12.0
500	900	400	2.13	188	2,274	363	74	12.0
500	950	450	2.12	212	2,612	414	74	11.5
550	850	300	2.16	139	1,731	278	74	12.0
550	900	350	2.16	162	2,068	329	74	12.0
550	950	400	2.15	186	2,406	380	74	11.5
600	850	250	2.16	116	1,460	233	74	12.0
600	900	300	2.16	139	1,798	285	74	11.5
600	950	350	2.13	164	2,135	336	74	11.5
650	850	200	2.15	93	1,189	189	74	11.5
650	900	250	2.14	117	1,527	240	74	11.5
650	950	300	2.13	141	1,865	291	74	11.5

TABLE A19. PROGRAMS FOR FINISHING YEARLING HEIFERS

Beginning weight, lb	Ending weight, lb	Total gain, lb	Av daily gain, lb	Days on feed	Total TDN, lb	Total crude protein, lb	Minimum percentage	
							TDN	C.P.
500	850	350	2.65	132	1,844	283	72	11
500	900	400	2.65	151	2,164	332	72	11
500	950	450	2.63	171	2,496	384	72	11
550	850	300	2.65	113	1,615	248	72	11
550	900	350	2.65	132	1,935	298	72	11
550	950	400	2.63	152	2,267	349	72	11
600	850	250	2.63	95	1,386	213	72	11
600	900	300	2.65	113	1,707	263	72	11
600	950	350	2.63	133	2,038	314	72	11
650	850	200	2.63	76	1,131	174	72	11
650	900	250	2.63	95	1,452	224	72	11
650	950	300	2.63	114	1,783	275	72	11
700	850	150	2.63	57	874	135	72	11
700	900	200	2.63	76	1,194	184	72	11
700	950	250	2.63	95	1,525	235	72	11

TABLE A20. PROGRAMS FOR GROWING STEERS (200-DAY FEEDING)

Beginning weight, lb	Ending weight, lb	Total gain, lb	Av daily gain, lb	Days on feed	Total TDN, lb	Total crude protein, lb	Minimum percentage	
							TDN	C.P.
400	510	110	0.55	200	1,146	198	57	10.0
400	620	220	1.10	200	1,549	270	60	10.5
400	730	330	1.65	200	1,904	326	65	11.0
450	560	110	0.55	200	1,182	202	57	10.0
450	670	220	1.10	200	1,680	293	59	10.5
450	780	330	1.65	200	2,022	348	64	11.0
500	610	110	0.55	200	1,363	221	57	9.0
500	720	220	1.10	200	1,810	316	58	10.0
500	830	330	1.65	200	2,209	369	64	10.5
550	660	110	0.55	200	1,543	238	57	9.0
550	770	220	1.10	200	1,940	340	57	10.0
550	880	330	1.65	200	2,396	391	63	10.5
600	600	—	0.00	200	1,146	154	57	7.5
600	710	110	0.55	200	1,543	238	57	9.0
600	820	220	1.10	200	2,050	349	57	9.5
600	930	330	1.65	200	2,483	390	63	10.0
650	650	—	0.00	200	1,146	154	57	7.5
650	760	110	0.55	200	1,543	238	57	9.0
650	870	220	1.10	200	2,161	358	57	9.5
650	980	330	1.65	200	2,569	390	63	9.5
700	700	—	0.00	200	1,146	154	57	7.5
700	810	110	0.55	200	1,688	254	57	8.5
700	920	220	1.10	200	2,271	367	57	9.0
700	1,030	330	1.65	200	2,656	389	63	9.0
750	750	—	0.00	200	1,146	154	57	7.5
750	860	110	0.55	200	1,868	274	57	8.5
750	970	220	1.10	200	2,381	376	57	9.0
750	1,080	330	1.65	200	2,743	388	63	9.0
800	800	—	0.00	200	1,411	194	57	8.0
800	910	110	0.55	200	1,940	282	57	8.5
800	1,020	220	1.10	200	2,425	379	57	9.0
800	1,130	330	1.65	200	2,778	388	63	9.0

TABLE A21. PROGRAMS FOR GROWING HEIFERS (200-DAY FEEDING)

Beginning weight, lb	Ending weight, lb	Total gain, lb	Av daily gain, lb	Days on feed	Total TDN, lb	Total crude protein, lb	Minimum percentage	
							TDN	C.P.
400	510	110	0.55	200	1,146	203	57	10.0
400	620	220	1.10	200	1,621	283	60	10.5
400	730	330	1.65	200	2,040	349	65	11.0
450	560	110	0.55	200	1,182	206	57	10.0
450	670	220	1.10	200	1,772	309	59	10.5
450	780	330	1.65	200	2,171	372	64	11.0
500	610	110	0.55	200	1,363	224	57	9.5
500	720	220	1.10	200	1,922	336	58	10.0
500	830	330	1.65	200	2,372	395	64	10.5
550	660	110	0.55	200	1,543	243	57	9.0
550	770	220	1.10	200	2,072	362	57	10.0
550	880	330	1.65	200	2,572	417	63	10.0
600	600	—	0.00	200	1,146	154	57	7.5
600	710	110	0.55	200	1,543	243	57	9.0
600	820	220	1.10	200	2,183	371	57	9.5
600	930	330	1.65	200	2,659	417	63	10.0
650	650	—	0.00	200	1,146	154	57	7.5
650	760	110	0.55	200	1,543	243	57	9.0
650	870	220	1.10	200	2,293	380	57	9.5
650	980	330	1.65	200	2,746	416	63	9.5
700	700	—	0.00	200	1,146	154	57	7.5
700	810	110	0.55	200	1,688	257	57	8.5
700	920	220	1.10	200	2,403	389	57	9.0
700	1,030	330	1.65	200	2,833	415	63	9.0
750	750	—	0.00	200	1,146	154	57	7.5
750	860	110	0.55	200	1,868	275	57	8.5
750	970	220	1.10	200	2,513	398	57	9.0
750	1,080	330	1.65	200	2,919	415	63	9.0

TABLE A22. PROGRAMS FOR GROWING STEERS (165-DAY FEEDING)

Beginning weight, lb	Ending weight, lb	Total gain, lb	Av daily gain, lb	Days on feed	Total TDN, lb	Total crude protein, lb	Minimum percentage	
							TDN	C.P.
450	630	180	1.10	165	1,340	234	60	10.5
450	720	270	1.65	165	1,618	280	65	11.0
500	680	180	1.10	165	1,470	257	58	10.0
500	770	270	1.65	165	1,723	302	64	11.0
550	730	180	1.10	165	1,601	280	57	10.0
550	820	270	1.65	165	1,912	323	63	10.5
600	780	180	1.10	165	1,626	282	57	10.0
600	870	270	1.65	165	1,997	322	63	10.0
650	830	180	1.10	165	1,736	291	57	9.5
650	920	270	1.65	165	2,083	322	63	9.5
700	880	180	1.10	165	1,846	300	57	9.5
700	970	270	1.65	165	2,179	321	63	9.5
750	930	180	1.10	165	1,957	309	57	9.0
750	1,020	270	1.65	165	2,257	320	63	9.0
800	980	180	1.10	165	2,001	312	57	9.0
800	1,070	270	1.65	165	2,294	320	63	9.0

TABLE A23. PROGRAMS FOR GROWING HEIFERS (165-DAY FEEDING)

Beginning weight, lb	Ending weight, lb	Total gain, lb	Av daily gain, lb	Days on feed	Total TDN, lb	Total crude protein, lb	Minimum percentage	
							TDN	C.P.
450	630	180	1.10	165	1,409	246	60	11.0
450	720	270	1.65	165	1,737	299	65	11.0
500	680	180	1.10	165	1,559	272	58	10.0
500	770	270	1.65	165	1,855	322	64	11.0
550	730	180	1.10	165	1,710	298	57	10.0
550	820	270	1.65	165	2,055	345	63	10.5
600	780	180	1.10	165	1,735	300	57	10.0
600	870	270	1.65	165	2,142	344	63	10.0
650	830	180	1.10	165	1,845	309	57	9.5
650	920	270	1.65	165	2,229	344	63	9.5
700	880	180	1.10	165	1,955	318	57	9.5
700	970	270	1.65	165	2,316	343	63	9.5
750	930	180	1.10	165	2,066	327	57	9.0
750	1,020	270	1.65	165	2,402	342	63	9.0

TABLE A24. PROPORTIONS OF ENERGY SUPPLEMENTING FEEDS NECESSARY TO RAISE TDN LEVELS OF BASIC FEEDS TO 60% ON 100% DRY-MATTER BASIS

% TDN of basic feed ^a	% TDN of energy supplementing feeds ^a													
	65	66	67	68	69	70	71	72	73	74	75	77	79	80
40	.80	.77	.74	.71	.69	.67	.65	.62	.61	.59	.57	.54	.51	.50
41	.79	.76	.73	.70	.68	.66	.63	.61	.59	.58	.56	.53	.50	.49
42	.78	.75	.72	.70	.67	.64	.62	.60	.58	.56	.55	.51	.49	.47
43	.77	.74	.71	.68	.65	.63	.61	.59	.57	.55	.53	.50	.47	.46
44	.76	.73	.70	.67	.64	.62	.60	.57	.55	.53	.52	.48	.46	.44
45	.75	.71	.68	.65	.62	.60	.58	.56	.54	.52	.50	.47	.44	.43
46	.74	.70	.67	.64	.61	.58	.56	.54	.52	.50	.48	.45	.42	.41
47	.72	.69	.65	.62	.59	.57	.54	.52	.50	.48	.46	.43	.41	.39
48	.71	.67	.63	.60	.57	.55	.52	.50	.48	.46	.44	.41	.39	.38
49	.69	.65	.61	.58	.55	.52	.50	.48	.46	.44	.42	.39	.37	.35
50	.66	.63	.59	.56	.53	.50	.48	.45	.43	.42	.40	.37	.35	.33
51	.64	.60	.56	.53	.50	.47	.45	.43	.41	.39	.38	.35	.32	.30
52	.62	.57	.53	.50	.47	.44	.42	.40	.38	.36	.35	.32	.30	.29
53	.58	.54	.50	.47	.44	.41	.39	.37	.35	.33	.32	.29	.27	.26
54	.55	.50	.46	.43	.40	.38	.35	.33	.32	.30	.29	.26	.24	.23
55	.50	.45	.42	.38	.36	.33	.31	.29	.28	.26	.25	.23	.21	.20
56	.44	.40	.36	.33	.30	.29	.27	.25	.24	.22	.21	.19	.17	.17
57	.38	.33	.30	.27	.25	.23	.21	.20	.19	.18	.17	.15	.14	.13
58	.29	.25	.22	.20	.18	.17	.15	.14	.13	.13	.12	.11	.10	.09
59	.17	.14	.13	.11	.10	.09	.08	.08	.07	.07	.06	.06	.05	.05

^aOn 100% dry-matter basis.

TABLE A25. PROPORTIONS OF ENERGY SUPPLEMENTING FEEDS NECESSARY TO RAISE TDN LEVELS OF BASIC FEEDS TO 63% ON 100% DRY-MATTER BASIS

% TDN of basic feed ^a	% TDN of energy supplementing feeds ^a													
	65	66	67	68	69	70	71	72	73	74	75	77	79	80
40	.92	.88	.85	.82	.79	.77	.74	.72	.70	.68	.66	.62	.59	.58
41	.92	.88	.85	.81	.79	.76	.73	.71	.69	.67	.65	.61	.58	.56
42	.91	.88	.84	.81	.78	.75	.72	.70	.68	.66	.64	.60	.57	.55
43	.91	.87	.83	.80	.77	.74	.71	.69	.67	.65	.62	.59	.56	.54
44	.90	.86	.83	.79	.76	.73	.70	.68	.66	.63	.61	.58	.54	.53
45	.90	.86	.82	.78	.75	.72	.69	.67	.64	.62	.60	.56	.53	.51
46	.90	.85	.81	.77	.74	.71	.68	.65	.63	.61	.59	.55	.52	.50
47	.89	.84	.80	.76	.73	.70	.67	.64	.62	.59	.57	.53	.50	.48
48	.88	.83	.79	.75	.71	.68	.65	.62	.60	.58	.56	.52	.48	.47
49	.88	.82	.78	.74	.70	.67	.64	.61	.58	.56	.54	.50	.47	.45
50	.87	.81	.76	.72	.68	.65	.62	.59	.57	.54	.52	.48	.45	.43
51	.86	.80	.75	.71	.67	.63	.60	.57	.55	.52	.50	.46	.44	.41
52	.85	.79	.73	.69	.65	.61	.58	.55	.52	.50	.48	.44	.41	.39
53	.83	.77	.71	.67	.62	.59	.56	.53	.50	.48	.45	.42	.38	.37
54	.82	.75	.69	.64	.60	.56	.53	.50	.47	.45	.43	.39	.36	.35
55	.80	.73	.67	.61	.57	.53	.50	.47	.44	.42	.40	.36	.33	.32
56	.78	.70	.64	.58	.54	.50	.47	.44	.41	.39	.37	.33	.30	.29
57	.75	.67	.60	.55	.50	.46	.43	.40	.38	.35	.33	.30	.27	.26
58	.71	.63	.56	.50	.45	.42	.38	.36	.33	.31	.29	.26	.24	.23
59	.67	.57	.50	.44	.40	.36	.33	.31	.29	.27	.25	.22	.20	.19
60	.60	.50	.43	.38	.33	.30	.27	.25	.23	.21	.20	.18	.16	.15
61	.50	.40	.33	.29	.25	.22	.20	.18	.17	.15	.14	.13	.11	.11
62	.33	.25	.20	.17	.14	.13	.11	.10	.09	.08	.08	.07	.06	.06

^aOn 100% dry-matter basis.

TABLE A26. PROPORTIONS OF ENERGY SUPPLEMENTING FEEDS NECESSARY TO RAISE TDN LEVELS OF BASIC FEEDS TO 65% ON 100% DRY-MATTER BASIS

% TDN of basic feed ^a	% TDN of energy supplementing feeds ^a													
	67	68	69	70	71	72	73	74	75	76	77	78	79	80
40	.93	.89	.86	.83	.81	.78	.76	.74	.71	.69	.68	.66	.64	.62
41	.92	.89	.86	.83	.80	.77	.75	.73	.71	.69	.68	.65	.62	.60
42	.92	.88	.85	.82	.80	.77	.74	.72	.70	.68	.66	.64	.62	.60
43	.92	.88	.85	.81	.79	.76	.73	.71	.69	.67	.65	.63	.61	.59
44	.91	.88	.84	.81	.78	.75	.72	.70	.68	.66	.64	.62	.60	.58
45	.91	.87	.83	.80	.77	.74	.71	.69	.67	.65	.63	.61	.59	.57
46	.90	.86	.83	.79	.76	.73	.70	.68	.66	.63	.61	.59	.58	.56
47	.90	.86	.82	.78	.75	.72	.69	.67	.64	.62	.60	.58	.56	.55
48	.89	.85	.81	.77	.74	.71	.68	.65	.63	.61	.59	.57	.55	.53
49	.89	.84	.80	.76	.73	.70	.67	.64	.62	.59	.57	.55	.53	.52
50	.88	.84	.79	.75	.71	.68	.65	.62	.60	.58	.56	.54	.52	.50
51	.88	.82	.78	.74	.70	.67	.64	.61	.58	.56	.54	.52	.50	.48
52	.87	.81	.76	.72	.68	.65	.62	.59	.57	.54	.52	.50	.48	.46
53	.86	.80	.75	.71	.67	.63	.60	.57	.55	.52	.50	.48	.46	.44
54	.85	.79	.73	.69	.65	.61	.58	.55	.52	.50	.48	.46	.44	.42
55	.83	.77	.71	.67	.62	.57	.55	.53	.50	.48	.46	.44	.42	.40
56	.82	.75	.69	.64	.60	.56	.53	.50	.47	.45	.43	.41	.39	.38
57	.80	.73	.67	.62	.57	.53	.50	.47	.44	.42	.40	.38	.36	.35
58	.78	.70	.64	.58	.54	.50	.47	.44	.41	.39	.37	.35	.33	.32
59	.75	.67	.60	.55	.50	.46	.43	.40	.38	.35	.33	.32	.30	.29
60	.71	.63	.56	.50	.45	.42	.38	.36	.33	.31	.29	.28	.26	.25
61	.67	.57	.50	.44	.40	.36	.33	.31	.29	.27	.25	.24	.22	.21
62	.60	.50	.43	.38	.33	.30	.27	.25	.23	.21	.20	.19	.18	.17
63	.50	.40	.33	.29	.25	.22	.20	.18	.17	.15	.14	.13	.13	.12
64	.33	.25	.20	.17	.14	.13	.11	.10	.09	.08	.08	.07	.07	.06

^aOn 100% dry-matter basis.

TABLE A27. PROPORTIONS OF ENERGY SUPPLEMENTING FEEDS NECESSARY TO RAISE TDN LEVELS OF BASIC FEEDS TO 72% ON 100% DRY-MATTER BASIS

% TDN of basic feed ^a	% TDN of energy supplementing feeds ^a							
	73	74	75	76	77	78	79	80
40	.97	.94	.91	.89	.86	.84	.82	.80
41	.97	.94	.91	.89	.86	.84	.82	.80
42	.97	.94	.91	.88	.86	.83	.81	.79
43	.97	.94	.91	.88	.85	.83	.81	.78
44	.97	.93	.90	.88	.85	.82	.80	.78
45	.96	.93	.90	.87	.84	.82	.79	.77
46	.96	.93	.90	.87	.84	.81	.79	.76
47	.96	.93	.89	.86	.83	.81	.78	.76
48	.96	.92	.89	.86	.83	.80	.77	.75
49	.96	.92	.88	.85	.82	.79	.77	.74
50	.96	.92	.88	.85	.81	.79	.76	.73
51	.95	.91	.88	.84	.81	.78	.75	.72
52	.95	.91	.87	.83	.80	.77	.74	.71
53	.95	.90	.86	.83	.79	.76	.73	.70
54	.95	.90	.86	.82	.78	.75	.72	.69
55	.94	.90	.85	.81	.77	.74	.71	.68
56	.94	.89	.84	.80	.76	.73	.70	.67
57	.94	.88	.83	.79	.75	.71	.68	.65
58	.93	.88	.82	.78	.74	.70	.67	.64
59	.93	.87	.81	.76	.72	.68	.65	.62
60	.92	.86	.80	.75	.71	.67	.63	.60
61	.92	.85	.79	.73	.69	.65	.61	.58
62	.91	.83	.77	.71	.67	.63	.59	.56
63	.90	.82	.75	.69	.64	.60	.56	.53
64	.89	.80	.73	.67	.62	.57	.53	.50
65	.88	.78	.70	.64	.58	.54	.50	.47
66	.86	.75	.67	.60	.55	.50	.46	.43
67	.83	.71	.63	.56	.50	.45	.42	.38
68	.80	.67	.57	.50	.44	.40	.36	.33
69	.75	.60	.50	.43	.38	.33	.30	.27
70	.67	.50	.40	.33	.29	.25	.22	.20
71	.50	.33	.25	.20	.17	.14	.13	.11

^aOn 100% dry-matter basis.

TABLE A28. PROPORTIONS OF ENERGY SUPPLEMENTING FEEDS NECESSARY TO RAISE TDN LEVELS OF BASIC FEEDS TO 74% ON 100% DRY-MATTER BASIS

% TDN of basic feed ^a	% TDN of energy supplementing feeds ^a					
	75	76	77	78	79	80
40	.97	.94	.92	.89	.87	.85
41	.97	.94	.92	.89	.87	.85
42	.97	.94	.91	.89	.86	.84
43	.97	.94	.91	.89	.86	.84
44	.97	.94	.91	.88	.86	.83
45	.97	.94	.91	.88	.85	.83
46	.97	.93	.90	.88	.85	.82
47	.96	.93	.90	.87	.84	.82
48	.96	.93	.90	.87	.84	.81
49	.96	.92	.89	.86	.83	.80
50	.96	.92	.89	.86	.83	.80
51	.96	.92	.88	.85	.82	.79
52	.96	.92	.88	.85	.81	.79
53	.95	.91	.88	.84	.81	.78
54	.95	.91	.87	.83	.80	.77
55	.95	.90	.86	.83	.79	.76
56	.95	.90	.86	.82	.78	.75
57	.94	.89	.85	.81	.77	.74
58	.94	.89	.84	.80	.76	.73
59	.94	.88	.83	.79	.75	.71
60	.93	.88	.82	.78	.74	.70
61	.93	.87	.81	.76	.72	.68
62	.92	.86	.80	.75	.71	.67
63	.92	.85	.79	.73	.69	.65
64	.91	.83	.77	.71	.67	.63
65	.90	.82	.75	.69	.64	.60
66	.89	.80	.73	.67	.62	.57
67	.88	.78	.70	.64	.58	.54
68	.86	.75	.67	.60	.55	.50
69	.83	.71	.63	.56	.50	.45
70	.80	.67	.57	.50	.44	.40
71	.75	.60	.50	.43	.38	.33
72	.67	.50	.40	.33	.29	.25
73	.50	.33	.25	.20	.17	.14

^aOn 100% dry-matter basis.

TABLE A29. PROPORTIONS OF PROTEIN SUPPLEMENTING FEEDS NECESSARY TO RAISE CRUDE PROTEIN LEVELS OF BASIC FEEDS TO 8% ON 100% DRY-MATTER BASIS

% C.P. of basic feed ^a	% C.P. of protein supplementing feeds ^a								
	10	15	20	25	30	35	40	45	50
4.0	.667	.363	.250	.190	.154	.129	.111	.098	.087
4.2	.655	.352	.240	.183	.147	.123	.106	.093	.083
4.4	.643	.340	.231	.175	.141	.118	.101	.089	.079
4.6	.630	.327	.221	.167	.134	.112	.096	.084	.075
4.8	.615	.314	.211	.158	.127	.106	.091	.080	.071
5.0	.600	.300	.200	.150	.120	.100	.086	.075	.067
5.2	.583	.286	.189	.141	.113	.094	.080	.070	.062
5.4	.565	.271	.178	.133	.106	.088	.075	.066	.058
5.6	.545	.256	.167	.124	.098	.082	.070	.061	.054
5.8	.525	.239	.155	.115	.091	.075	.064	.056	.050
6.0	.500	.222	.143	.105	.083	.069	.059	.051	.045
6.2	.475	.205	.131	.096	.076	.062	.053	.046	.041
6.4	.445	.186	.118	.086	.068	.056	.048	.041	.037
6.6	.412	.167	.104	.076	.060	.049	.042	.036	.032
6.8	.375	.146	.091	.066	.052	.043	.036	.031	.028
7.0	.333	.125	.077	.056	.043	.036	.030	.026	.023
7.2	.286	.103	.062	.045	.035	.029	.024	.021	.019
7.4	.231	.079	.048	.034	.027	.022	.018	.016	.014
7.6	.167	.054	.032	.023	.018	.015	.012	.011	.009
7.8	.091	.028	.016	.012	.009	.007	.006	.005	.005

^aOn 100% dry-matter basis.

TABLE A30. PROPORTIONS OF PROTEIN SUPPLEMENTING FEEDS NECESSARY TO RAISE CRUDE PROTEIN LEVELS OF BASIC FEEDS TO 9% ON 100% DRY-MATTER BASIS

% C.P. of basic feed ^a	% C.P. of protein supplementing feeds ^a								
	10	15	20	25	30	35	40	45	50
4.0	.833	.455	.312	.238	.192	.161	.139	.122	.109
4.2	.828	.445	.304	.231	.186	.156	.134	.118	.105
4.4	.822	.434	.295	.223	.180	.150	.129	.113	.101
4.6	.815	.423	.286	.216	.173	.145	.124	.109	.097
4.8	.808	.412	.276	.208	.167	.139	.119	.105	.093
5.0	.800	.400	.267	.200	.160	.133	.114	.100	.089
5.2	.792	.388	.257	.192	.153	.127	.109	.095	.085
5.4	.783	.375	.247	.184	.146	.122	.104	.091	.081
5.6	.773	.362	.236	.175	.139	.116	.099	.086	.077
5.8	.763	.348	.225	.167	.132	.110	.094	.082	.072
6.0	.750	.333	.214	.158	.125	.103	.088	.077	.068
6.2	.736	.318	.203	.149	.118	.097	.083	.072	.064
6.4	.722	.302	.191	.140	.110	.091	.077	.067	.060
6.6	.706	.286	.179	.130	.103	.084	.072	.062	.055
6.8	.687	.268	.167	.121	.095	.078	.066	.058	.051
7.0	.667	.250	.154	.111	.087	.071	.061	.053	.047
7.2	.644	.231	.141	.101	.079	.065	.055	.048	.042
7.4	.615	.211	.127	.091	.071	.058	.049	.043	.038
7.6	.584	.189	.113	.080	.062	.051	.043	.037	.033
7.8	.545	.167	.098	.070	.054	.044	.037	.032	.028
8.0	.500	.143	.083	.059	.045	.037	.031	.027	.024
8.2	.445	.118	.068	.048	.037	.030	.025	.022	.019
8.4	.375	.091	.052	.036	.028	.023	.019	.016	.014
8.6	.286	.062	.035	.024	.018	.015	.013	.011	.010
8.8	.167	.032	.018	.012	.009	.008	.006	.006	.005

^aOn 100% dry-matter basis.

TABLE A31. PROPORTIONS OF PROTEIN SUPPLEMENTING FEEDS NECESSARY TO RAISE CRUDE PROTEIN LEVELS OF BASIC FEEDS TO 10% ON 100% DRY-MATTER BASIS

% C.P. of basic feed ^a	% C.P. of protein supplementing feeds ^a							
	15	20	25	30	35	40	45	50
4.0	.545	.375	.286	.231	.194	.167	.146	.130
4.2	.536	.367	.279	.225	.188	.162	.142	.127
4.4	.528	.359	.272	.219	.183	.157	.138	.123
4.6	.519	.351	.265	.213	.178	.153	.134	.119
4.8	.510	.342	.257	.206	.172	.148	.129	.115
5.0	.500	.333	.250	.200	.167	.143	.125	.111
5.2	.490	.324	.242	.194	.161	.138	.121	.107
5.4	.479	.315	.235	.187	.155	.133	.116	.103
5.6	.468	.306	.227	.180	.150	.128	.112	.099
5.8	.457	.296	.218	.174	.144	.123	.107	.095
6.0	.444	.286	.211	.167	.138	.118	.103	.091
6.2	.432	.275	.202	.161	.133	.114	.099	.088
6.4	.419	.265	.194	.153	.126	.107	.093	.083
6.6	.405	.254	.185	.145	.120	.102	.089	.078
6.8	.390	.242	.176	.138	.113	.096	.084	.074
7.0	.375	.231	.167	.130	.107	.091	.079	.070
7.2	.359	.219	.157	.123	.101	.085	.074	.065
7.4	.342	.206	.148	.115	.094	.080	.069	.061
7.6	.324	.194	.138	.107	.088	.074	.064	.057
7.8	.306	.180	.128	.099	.081	.068	.059	.052
8.0	.286	.167	.118	.091	.074	.062	.054	.048
8.2	.265	.153	.107	.082	.067	.057	.049	.043
8.4	.242	.138	.096	.074	.060	.051	.044	.038
8.6	.219	.123	.085	.065	.053	.045	.038	.034
8.8	.194	.107	.074	.057	.046	.038	.033	.029
9.0	.167	.091	.062	.048	.038	.032	.028	.024
9.2	.137	.074	.050	.038	.031	.025	.022	.019
9.4	.107	.056	.038	.029	.023	.019	.016	.014
9.6	.074	.038	.025	.019	.015	.013	.011	.009
9.8	.038	.019	.013	.009	.007	.006	.005	.004

^aOn 100% dry-matter basis.

TABLE A32. PROPORTIONS OF PROTEIN SUPPLEMENTING FEEDS NECESSARY TO RAISE CRUDE PROTEIN LEVELS OF BASIC FEEDS TO 11% ON 100% DRY-MATTER BASIS

% C.P. of basic feed ^a	% C.P. of protein supplementing feed ^a							
	15	20	25	30	35	40	45	50
4.0	.636	.438	.333	.269	.226	.194	.171	.152
4.2	.629	.430	.327	.264	.221	.190	.167	.148
4.4	.623	.423	.320	.258	.216	.186	.163	.145
4.6	.615	.416	.314	.252	.211	.181	.158	.141
4.8	.608	.408	.307	.246	.205	.176	.154	.137
5.0	.600	.400	.300	.240	.200	.171	.150	.133
5.2	.592	.392	.293	.234	.195	.166	.146	.129
5.4	.583	.384	.285	.228	.189	.162	.141	.126
5.6	.574	.375	.278	.221	.184	.157	.137	.122
5.8	.565	.366	.271	.215	.178	.152	.133	.118
6.0	.556	.357	.263	.208	.172	.147	.128	.114
6.2	.545	.348	.255	.202	.167	.142	.124	.110
6.4	.535	.338	.247	.195	.161	.137	.119	.106
6.6	.524	.328	.239	.188	.155	.132	.115	.101
6.8	.512	.318	.231	.181	.149	.127	.110	.097
7.0	.500	.308	.222	.174	.143	.121	.105	.093
7.2	.487	.297	.213	.167	.137	.116	.101	.089
7.4	.474	.286	.205	.159	.130	.110	.095	.085
7.6	.459	.274	.196	.152	.124	.105	.091	.080
7.8	.444	.262	.186	.144	.118	.099	.086	.076
8.0	.429	.250	.176	.136	.111	.094	.081	.071
8.2	.412	.237	.167	.129	.104	.088	.076	.067
8.4	.394	.224	.157	.120	.098	.082	.071	.062
8.6	.375	.211	.146	.112	.091	.076	.066	.058
8.8	.355	.196	.136	.104	.084	.071	.061	.053
9.0	.333	.182	.125	.095	.077	.065	.056	.049
9.2	.310	.166	.113	.086	.069	.058	.050	.044
9.4	.285	.150	.102	.077	.062	.052	.044	.039
9.6	.259	.134	.090	.068	.055	.046	.039	.034
9.8	.230	.117	.078	.059	.047	.039	.034	.029
10.0	.200	.100	.066	.050	.040	.033	.028	.025
10.2	.166	.081	.054	.040	.032	.026	.022	.020
10.4	.130	.062	.041	.030	.024	.020	.017	.015
10.6	.090	.042	.027	.020	.016	.013	.011	.010
10.8	.047	.021	.014	.010	.008	.006	.005	.005

^aOn 100% dry-matter basis.

TABLE A33. PROPORTIONS OF PROTEIN SUPPLEMENTING FEEDS NECESSARY TO RAISE CRUDE PROTEIN LEVELS OF BASIC FEEDS TO 12% ON 100% DRY-MATTER BASIS

% C.P. of basic feed ^a	% C.P. of protein supplementing feeds ^a							
	15	20	25	30	35	40	45	50
4.0	.727	.500	.381	.308	.258	.222	.195	.174
4.2	.722	.494	.375	.302	.253	.218	.191	.170
4.4	.717	.487	.369	.297	.248	.213	.187	.167
4.6	.712	.481	.363	.291	.243	.209	.183	.163
4.8	.706	.474	.356	.285	.238	.205	.179	.159
5.0	.700	.467	.350	.280	.233	.200	.175	.155
5.2	.694	.459	.343	.274	.228	.195	.171	.152
5.4	.688	.452	.337	.268	.223	.191	.167	.148
5.6	.681	.444	.330	.262	.218	.186	.162	.144
5.8	.674	.437	.323	.256	.212	.181	.158	.140
6.0	.667	.429	.316	.250	.207	.176	.154	.136
6.2	.659	.420	.309	.244	.201	.172	.149	.132
6.4	.651	.412	.301	.237	.196	.167	.145	.128
6.6	.643	.403	.293	.231	.190	.162	.141	.124
6.8	.634	.394	.286	.224	.184	.157	.136	.120
7.0	.625	.385	.278	.217	.179	.152	.132	.116
7.2	.615	.375	.270	.211	.173	.146	.127	.112
7.4	.605	.365	.261	.204	.167	.140	.122	.108
7.6	.595	.355	.253	.196	.161	.136	.118	.104
7.8	.584	.343	.244	.189	.154	.130	.113	.100
8.0	.571	.333	.235	.182	.148	.125	.108	.095
8.2	.559	.322	.226	.174	.142	.119	.103	.091
8.4	.545	.310	.217	.167	.135	.114	.098	.087
8.6	.531	.298	.207	.159	.129	.108	.093	.082
8.8	.516	.286	.198	.151	.122	.103	.088	.078
9.0	.500	.273	.188	.143	.115	.097	.083	.073
9.2	.482	.259	.177	.134	.108	.090	.078	.068
9.4	.464	.245	.166	.126	.101	.084	.073	.064
9.6	.444	.230	.155	.117	.094	.078	.067	.059
9.8	.423	.215	.144	.108	.087	.072	.062	.054
10.0	.400	.200	.133	.100	.080	.066	.057	.050
10.2	.375	.183	.121	.090	.072	.060	.051	.045
10.4	.347	.166	.109	.081	.065	.054	.046	.040
10.6	.318	.145	.095	.071	.056	.047	.040	.035
10.8	.285	.130	.084	.062	.049	.041	.035	.030
11.0	.250	.111	.071	.052	.041	.034	.029	.025
11.2	.210	.090	.057	.033	.027	.024	.023	.020
11.4	.166	.069	.044	.032	.025	.020	.017	.015
11.6	.117	.047	.029	.021	.017	.014	.011	.010
11.8	.062	.024	.015	.010	.008	.007	.006	.005

^aOn 100% dry-matter basis.

TABLE A34. ANNUAL REAL ESTATE COST PER HEAD, \$

Total real estate investment/head ^a	Annual real estate cost %						
	.08	.10	.12	.14	.16	.18	.20
\$ 10	\$.80	\$ 1.00	\$ 1.20	\$ 1.40	\$ 1.60	\$ 1.80	\$ 2.00
20	1.60	2.00	2.40	2.80	3.20	3.60	4.00
30	2.40	3.00	3.60	4.20	4.80	5.40	6.00
40	3.20	4.00	4.80	5.60	5.40	7.20	8.00
50	4.00	5.00	6.00	7.00	8.00	9.00	10.00
60	4.80	6.00	7.20	8.40	9.60	10.80	12.00
70	5.60	7.00	8.40	9.80	11.20	12.60	14.00
80	6.40	8.00	9.60	11.20	12.80	14.40	16.00
90	7.20	9.00	10.80	12.60	14.40	16.20	18.00
100	8.00	10.00	12.00	14.00	16.00	18.00	20.00
110	8.80	11.00	13.20	15.40	17.60	19.80	22.00
120	9.60	12.00	14.40	16.80	19.20	21.60	24.00
130	10.40	13.00	15.60	18.20	20.80	23.40	26.00
140	11.20	14.00	16.80	19.60	22.40	25.20	28.00
150	12.00	15.00	18.00	21.00	24.00	27.00	30.00
160	12.80	16.00	19.20	22.40	25.60	28.80	32.00
170	13.60	17.00	20.40	23.80	27.20	30.60	34.00
180	14.40	18.00	21.60	25.20	28.80	32.40	36.00
190	15.20	19.00	22.80	26.60	30.40	34.20	38.00
200	16.00	20.00	24.00	28.00	32.00	36.00	40.00

^aCalculated from total real estate investment and the capacity (number of head) of the real estate facilities which are in use.

TABLE A35. REAL ESTATE COST PER HEAD SOLD, \$

Annual real estate cost/head	Rate of turnover												
	.6	.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0
	Dollars												
\$ 1.00	1.67	1.25	1.00	.83	.71	.63	.56	.50	.45	.42	.38	.36	.33
2.00	3.33	2.50	2.00	1.67	1.43	1.25	1.11	1.00	.91	.83	.77	.71	.67
3.00	5.00	3.75	3.00	2.50	2.14	1.88	1.67	1.50	1.36	1.25	1.15	1.07	1.00
4.00	6.67	5.00	4.00	3.33	2.86	2.50	2.22	2.00	1.81	1.67	1.54	1.43	1.33
5.00	8.33	6.25	5.00	4.17	3.57	3.13	2.78	2.50	2.27	2.08	1.92	1.79	1.67
6.00	10.00	7.50	6.00	5.00	4.29	3.75	3.33	3.00	2.73	2.50	2.31	2.14	2.00
7.00	11.67	8.75	7.00	5.83	5.00	4.38	3.89	3.50	3.18	2.92	2.69	2.50	2.33
8.00	13.33	10.00	8.00	6.67	5.71	5.00	4.44	4.00	3.64	3.33	3.08	2.86	2.67
9.00	15.00	11.25	9.00	7.50	6.43	5.63	5.00	4.50	4.09	3.75	3.46	3.21	3.00
10.00	16.67	12.50	10.00	8.33	7.14	6.25	5.56	5.00	4.55	4.17	3.85	3.57	3.33
11.00	18.33	13.75	11.00	9.17	7.86	6.88	6.11	5.50	5.00	4.58	4.23	3.93	3.67
12.00	20.00	15.00	12.00	10.00	8.57	7.50	6.67	6.00	5.45	5.00	4.62	4.29	4.00
13.00	21.67	16.25	13.00	10.83	9.29	8.13	7.22	6.50	5.91	5.42	5.00	4.64	4.33
14.00	23.33	17.50	14.00	11.67	10.00	8.75	7.78	7.00	6.36	5.83	5.38	5.00	4.67
15.00	25.00	18.75	15.00	12.50	10.71	9.38	8.33	7.50	6.82	6.25	5.77	5.36	5.00
16.00	26.67	20.00	16.00	13.33	11.43	10.00	8.89	8.00	7.27	6.67	6.15	5.71	5.33
17.00	28.33	21.25	17.00	14.17	12.14	10.63	9.44	8.50	7.72	7.08	6.54	6.07	5.67
18.00	30.00	22.50	18.00	15.00	12.86	11.25	10.00	9.00	8.18	7.50	6.92	6.43	6.00
19.00	31.67	23.75	19.00	15.83	13.57	11.88	10.56	9.50	8.64	7.92	7.31	6.79	6.33
20.00	33.33	25.00	20.00	16.67	14.29	12.50	11.11	10.00	9.09	8.33	7.69	7.14	6.67
21.00	35.00	26.25	21.00	17.50	15.00	13.13	11.67	10.50	9.55	8.75	8.08	7.50	7.00
22.00	36.67	27.50	22.00	18.33	15.71	13.75	12.22	11.00	10.00	9.17	8.46	7.86	7.33
23.00	38.33	28.75	23.00	19.17	16.43	14.38	12.78	11.50	10.45	9.58	8.85	8.21	7.67
24.00	40.00	30.00	24.00	20.00	17.14	15.00	13.33	12.00	10.91	10.00	9.23	8.57	8.00
25.00	41.67	31.25	25.00	20.83	17.86	15.63	13.89	12.50	11.36	10.42	9.62	8.93	8.33
26.00	43.33	32.50	26.00	21.67	18.57	16.25	14.44	13.00	11.82	10.83	10.00	9.29	8.67
27.00	45.00	33.75	27.00	22.50	19.29	16.88	15.00	13.50	12.27	11.25	10.38	9.64	9.00
28.00	46.67	35.00	28.00	23.33	20.00	17.50	15.56	14.00	12.73	11.67	10.77	10.00	9.33
29.00	48.33	36.25	29.00	24.17	20.71	18.13	16.11	14.50	13.18	12.08	11.15	10.36	9.67
30.00	50.00	37.50	30.00	25.00	21.43	18.75	16.67	15.00	13.64	12.50	11.54	10.71	10.00
31.00	51.67	38.75	31.00	25.83	22.14	19.38	17.22	15.50	14.09	12.92	11.92	11.07	10.33
32.00	53.33	40.00	32.00	26.67	22.86	20.00	17.78	16.00	14.54	13.33	12.31	11.43	10.67
33.00	55.00	41.25	33.00	27.50	23.57	20.63	18.33	16.50	15.00	13.75	12.69	11.79	11.00
34.00	56.67	42.50	34.00	28.33	24.29	21.25	18.89	17.00	15.45	14.17	13.08	12.14	11.33
35.00	58.33	43.75	35.00	29.17	25.00	21.88	19.44	17.50	15.91	14.58	13.46	12.50	11.67
36.00	60.00	45.00	36.00	30.00	25.71	22.50	20.00	18.00	16.36	15.00	13.85	12.85	12.00
37.00	61.67	46.25	37.00	30.83	26.43	23.13	20.56	18.50	16.82	15.42	14.23	13.21	12.33
38.00	63.33	47.50	38.00	31.67	27.14	23.75	21.11	19.00	17.27	15.83	14.62	13.57	12.67
39.00	65.00	48.75	39.00	32.50	27.86	24.38	21.67	19.50	17.73	16.25	15.00	13.93	13.00
40.00	66.67	50.00	40.00	33.33	28.57	25.00	22.22	20.00	18.18	16.67	15.38	14.29	13.33

TABLE A36. LABOR REQUIREMENTS PER FEEDER,^a HOURS

Months in feedlot	Feed and method of feeding ^b							
	1	2	3	4	5	6	7	8
1	.20	.38	.30	.48	.17	.36	.13	.31
2	.34	.71	.52	.89	.28	.65	.18	.55
3	.47	1.02	.74	1.30	.37	.94	.24	.80
4	.59	1.34	.96	1.72	.48	1.22	.29	1.04
5	.72	1.66	1.19	2.12	.60	1.51	.35	1.28
6	.85	1.98	1.40	2.53	.68	1.80	.41	1.52
7	.98	2.29	1.63	2.94	.78	2.09	.46	1.76
8	1.12	2.60	1.85	3.35	.88	2.38	.52	2.00
9	1.25	2.93	2.08	3.76	.98	2.66	.56	2.26
10	1.37	3.24	2.29	4.16	1.08	2.95	.62	2.50
11	1.50	3.56	2.52	4.57	1.19	3.24	.67	2.74
12	1.63	3.88	2.75	4.99	1.28	3.53	.73	2.98
13	1.76	4.19	2.96	5.40	1.38	3.82	.79	3.22
14	1.90	4.51	3.19	5.81	1.49	4.10	.84	3.46
15	2.03	4.82	3.41	6.22	1.58	4.39	.90	3.71
16	2.15	5.15	3.64	6.62	1.69	4.68	.95	3.95
17	2.28	5.46	3.85	7.03	1.79	4.97	1.01	4.19
18	2.41	5.78	4.08	7.44	1.90	5.26	1.06	4.43
19	2.54	6.10	4.30	7.85	1.99	5.54	1.12	4.67
20	2.68	6.41	4.52	8.27	2.09	5.83	1.18	4.91

^aThese labor requirements have been estimated by combining the times taken for various tasks on the observed farms, and include feeding, bedding, cleaning, inspection, receiving and shipping.

1. hay
2. hay and grain
3. silage, front-end loader direct to feed bunk
4. silage, front-end loader direct to feed bunk, and grain
5. silage, wagon to feed bunk
6. silage, wagon to feed bunk, and grain
7. self-feeding silo
8. self-feeding silo and grain

APPENDIX 2

COST CALCULATIONS FOR FARM PREPARED RATIONS^a

Capital investment in:

Equipment \$ _____ (1)

Storage and buildings^b _____ (2)

\$ _____ (3)

Annual fixed costs:

Depreciation: Equipment, _____ (1) at _____ %^c \$ _____

: Storage and buildings, _____ (2) at _____ %^c _____

Cost of capital investment, _____ (3) at _____ % _____

Repairs^d _____

Insurance _____

Taxes on storage and buildings _____ (2) at _____ % _____

Annual operating costs:

Power and utilities: _____ tons at \$ _____

Transportation: actual cost, or _____ miles at \$ _____

Labor, _____ hours at \$ _____

Custom work, actual cost, or _____ tons at \$ _____ /ton

Feed ingredients: _____ tons at \$ _____ /ton

Total annual costs \$ \$ _____

Annual feed volume _____ tons

Cost/ton \$ _____

^aSee Gervason and Jose: Economics of Farm Feed Processing, Economics Division, Nova Scotia Dept. of Agriculture and Marketing, Truro, N. S., 41 pp., August 1970.

^b Those in addition to feed storage associated with the beef barn.

^cTypical depreciation rates are 10% of original value for equipment and 5% of original value for storages and buildings.

^dRepairs would commonly be about 5% of original value for equipment and about 2% of original value for buildings.

APPENDIX 3

COSTING BLANKS FOR THE COW-CALF ENTERPRISE

Information item no.	Item	Level
1.	Cow weight and calving date	
2.	Energy and protein levels of basic feed, %	
3.	Price of basic feed/lb, fob feed bunk	a
4.	Energy and protein levels of energy supplementing feed, %	
5.	Price of energy supplementing feed/lb, fob feed bunk	a
6.	Energy and protein levels of protein supplementing feed, %	
7.	Price of protein supplementing feed/lb, fob feed bunk	a
8.	Amount of basic feed required, air dry basis, cows, lb	
9.	Amount of energy supplementing feed required, air dry basis, cows, lb	
10.	Amount of protein supplementing feed required, air dry basis, cows, lb	
11.	Energy and protein levels of pasture, %	
12.	Amount of pasture required, cows (plus 20% for calf), acres	
13.	Price of pasture/ac	a
14.	Amount of creep feed fed, air dry basis, lb	
15.	Price of creep feed/lb, fob feeding area	
16.	Bull weight, lb	
17.	Amount of basic feed required, air dry basis, bull, lb	
18.	Amount of energy supplementing feed required, air dry basis, bulls, lb	
19.	Amount of protein supplementing feed required, air dry basis, bulls, lb	
20.	Cow/bull ratio	
21.	Initial cow value, fob farm	
22.	Cull cow value, fob farm	
23.	Cow death loss %	
24.	Total cow depreciation, including death loss adjustment	
25.	Expected cow service life, years	
26.	Initial bull value, fob farm	
27.	Cull bull value, fob farm	
28.	Bull death loss %	
29.	Total bull depreciation, including death loss adjustment	
30.	Expected bull service life, years	
31.	Total real estate investment/cow	
32.	Annual real estate cost %	
33.	Hourly wage rate	
34.	Annual interest rate, %	
35.	Annual management charge, % of calf receipts	
36.	Expected calf price/lb, fob farm	
37.	Amount of bedding, lb	
38.	Price of bedding/lb, fob lot	
39.	Weaning weight, average of steers and heifers, lb	
40.	Weaning %	

^aFeed prices are fob farm. In the case of homegrown feeds the price covers all costs including operator's labor and management, interest and storage charges. See 'Maritime Grain Production Costs' and 'Maritime Forage Production Costs'.

ITEM AMOUNTS AND COSTS PER COW PER YEAR

Expense	Information item no.	Tables	Amount	Cost/yr	% of total cost
A Basic feed, cows	1 to 10 inc.	A1 to A7 inc.			
B Energy supp. feed, cows	"	"			
C Protein supp. feed, cows	"	"			
D Pasture, cows	1 to 13 inc.	"			
E Creep, calf	14, 15	—			
F Basic feed, bulls	3, 5, 7, 16, 17,18,19,20	A3,A8,A9 A11, A31			
G Energy supp. feed, bulls	"				
H Protein supp. feed, bulls	"				
I Salt, vitamins, minerals	—				
J Subtotal, items A—I: feed					
K Cow depreciation	21-25 inc.	A12			
L Bull depreciation	26-30 inc.	A13			
M Real estate charge	31, 32	A14			
N Veterinary medicine	—	—			
O Utilities and miscellaneous	—	—			
P Bedding	—	—			
Q Subtotal, items K—P					
R Labor	—	—			
S Cost of capital	3,5,7,8-10, 12-19, 24, 29, 31, 34				
			$\text{_____} \times \left(\left(\frac{\text{_____} + \text{_____}}{2} \right) + \left(\frac{\text{_____} + \text{_____}}{2} \right) + \frac{\text{_____}}{2} + \frac{\text{_____}}{2} \right)$		
T Management	35, 39, 40, 41				
			$\text{_____} \times \text{_____} \times \frac{\text{_____} + \text{_____}}{2} \times \text{_____}$		
Total cost/cow					
U Receipts, _____ lb heifer, _____ lb steer, at \$ _____ /lb, _____ % weaning rate					
V Return to labor, management and capital, U-J-Q					
W Return to management and labor, V-S					
Y Return to capital, V-R-T					
Z Return to labor, W-T					

COSTING BLANKS FOR THE FEEDER ENTERPRISE

Information item no.	Item	Level
1.	Class of stock and feeding program	_____
2.	Beginning and ending weights, lb	_____
3.	Days on feed and annual rate of turnover	_____
4.	Energy and protein levels of basic feed, %	_____
5.	Price of basic feed/lb. fob feed bunk	_____
6.	Energy and protein levels of energy supplementing feed, %	_____
7.	Price of energy supplementing feed/lb, fob feed bunk	_____
8.	Energy and protein levels of protein supplementing feed, %	_____
9.	Price of protein supplementing feed/lb, fob feed bunk	_____
10.	Amount of basic feed required, air dry basis, lb	_____
11.	Amount of energy supplementing feed required, air dry basis, lb	_____
12.	Amount of protein supplementing feed required, air dry basis, lb	_____
13.	Energy and protein levels of pasture, %	_____
14.	Amount of pasture required, acres	_____
15.	Price of pasture/ac	_____
16.	Price of feeders at purchase/lb, fob farm	_____
17.	Death loss, %	_____
18.	Total real estate investment per head of capacity in use	_____
19.	Annual real estate cost, %	_____
20.	Hourly wage rate	_____
21.	Annual interest rate, %	_____
22.	Management charge, % of gross receipts	_____
23.	Price of cattle at sale/lb, fob farm	_____
24.	Amount of bedding, lb	_____
25.	Price of bedding/lb, fob farm	_____
26.	Method of feed handling	_____
27.	Hours of labor required per head	_____

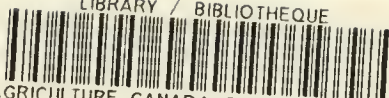
ITEM AMOUNTS AND COSTS PER HEAD

Expense		Item No.	Table	Amount	Cost	% of total cost
A	Basic feed	1 to 15	A16,A27,A32			
B	Energy supp. feed	"	"			
C	Protein supp. feed	"	"			
D	Salt and mineral	-	-	-		
E	Vitamins and hormones	-	-	-		
F	Subtotal, items A-E: feed					
G	Real estate charge	3, 18, 19	A34, A35	-		
H	Feeder	2, 16				
I	Death loss	2,16,17,23	-	-		
J	Veterinary, medicine	-	-	-		
K	Utilities, miscellaneous	-	-	-		
L	Bedding	24, 25	-			
M	Subtotal, items G-L					
N	Labor	20, 26, 27	A36			
O	Cost of capital	1, 4-15, 16, 18	-	-		
	$\text{_____} \times \left(\frac{1}{2} \times \text{_____} + \frac{1}{2} \times \text{_____} + \text{_____} \right)$					
P	Management	2, 22, 23	-	-		
	$\text{_____} \times \text{_____} \times \text{_____}$					
	Total cost per feeder					
Q	Receipts, _____ lb steer at _____ /lb					
R	Return to labor, management and capital, Q-F-M					
S	Return to management and labor, R-O					
T	Return to management, S-N					
U	Return to capital, R-N-P					
V	Return to labor, S-P					

DATE: 10/10/54
SUBJECT: [Illegible]

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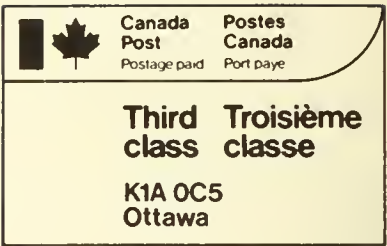
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